

SLOCUM CREEK TIMBER SALE PROJECT ENVIRONMENTAL ASSESSMENT (EA)

Proposed Action: The Montana Department of Natural Resources and Conservation proposes forest management activities on forested State Trust Lands. The planned activities would include the sale and harvest of approximately 2.1 MMBF board feet of wood products from state land located 9 miles east of Stevensville, Montana in Sections 36 & 24 of Township 9 North, Range 19 West and Section 30 Township 9 North, Range 18 West. The proposed action plan could begin implementation as early as the winter of 2012.

Type of Document: Environmental Assessment

Decision Maker: Robert Storer
Southwestern Land Office
1401 27th Ave
Missoula, MT 59804
406-542-4264

Further Information: Paul Moore
Hamilton Unit
P.O. Box 713
Hamilton, MT 59840
406-363-1585

Special Note: Comments received in response to this project will be available for public inspection and will be released in their entirety if requested pursuant to the Montana Constitution.

HOW TO READ THIS EA (ENVIRONMENTAL ASSESSMENT)

To read this EA more effectively, carefully study this page. Following State regulations, we have designed and written this document (1) **to provide** the Project Decision Maker with sufficient information to make an informed, reasoned decision concerning the proposed Slocum Creek timber sale and (2) **to inform** members of the affected and interested public of this project's effects to the environment.

The EA consists of the following chapters:

- 1 Purpose and Need for Action
- 2 Alternatives, Including the Proposed Action
- 3 Existing Environment
- 4 Environmental Effects
- 5 Slocum Creek Timber Sale Findings
- 6 References

Chapters 1 and 2 together serve as a summary overview of the Slocum Creek Timber Sale Project. These two chapters have been written so that non-technical readers can understand the potential environmental, technical, economic, and social consequences of **taking** and of **not taking** action.

Chapter 1 introduces the Slocum Creek Timber Sale. It provides a very brief description of the proposed Slocum Creek Timber Sale and then explains three key things about the project:

- (1) The relevant environmental issues,
- (2) The decisions that the Project Decision Maker must make concerning this project, and
- (3) The relevant laws, regulations, and consultations with which the DNRC must comply.

Chapter 2 provides detailed descriptions of Alternative A: No Entry (No Action) and the (Action) Alternative B.

Chapter 3 briefly describes the past and current conditions of the relevant resources (*issues*) in the project area that would be meaningfully affected, establishing a part of the baseline used for the comparison of the predicted effects of the alternatives.

Chapter 4 presents the detailed, analytic predictions of the consequences of implementing Alternative A: No Harvest (No Action), and (Action) Alternative B. These predictions include the direct, indirect, and cumulative effects of implementing the alternatives.

Chapter 5 describes findings of the Slocum Creek Timber Sale project.

Chapter 6 lists preparers, references, and abbreviations used.

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CHAPTER 1: PURPOSE & NEED

1.1 DESCRIPTION OF PROPOSED ACTION

The Department of Natural Resources and Conservation (DNRC), Hamilton Unit, proposes to harvest timber on state lands to generate revenue on 357 acres of Montana Common Schools Trust lands and 57 acres of Public Building Trust lands. The project area is located approximately 9 miles east of Stevensville, Montana, and involves an area within sections 36 & 24, in T9N, R19W and section 30 in T9N, R18W. The total gross sale area is approximately 1,320 acres (see vicinity map, Figure 1). If the harvest alternative is selected approximately 2.1 million board feet (MMBF) would be harvested with various even and uneven-aged silvicultural treatments. Harvesting could begin as early as the winter of year 2012 with all associated activities being complete by June, 2014.

To accomplish this project and provide better access for future management of these parcels, approximately .69 miles of permanent new road would be constructed, 1.3 miles of road reconstruction would take place and .4 miles of road would be abandoned. All roads used within the project area would be maintained and/or improved to meet Best Management Practices (BMPs). After completion of the project approximately 8.0 miles of road would exist within the project area. These roads would continue to be closed to the general public for motorized use.

1.2 NEED FOR ACTION

Forest Management activities are being proposed to address a decline in timber stand health due to the following factors:

- increased severity and spread of Dwarf Mistletoe
- Insect and Disease outbreaks (including Mountain Pine Beetle and Pine Butterfly)
- increased stress from competition resulting from overstocking

In addition to increasing overall stand health and vigor, treating the above mentioned factors would also produce revenue and move the stands toward their historic conditions.

The lands in this project are held in trust by the State of Montana for the support of specific beneficiary institutions (Enabling Act of February 22, 1889; 1972 Montana Constitution, Article X, Section 11). The Board of Land Commissioners (Land Board) and DNRC are legally required to administer these trust lands to produce the largest measure of reasonable and legitimate long-term return for the trust beneficiaries (Montana Code Annotated 77-1-202).

This project was developed in compliance with the State Forest Land Management Plan (SFLMP), the Administrative Rules for Forest Management (Forest Management Rules; ARM 36.11.401 through 471), and conservation commitments contained in the Montana Forested State Trust Lands Habitat Conservation Plan (HCP), as well as other applicable state and federal laws.

On June 17, 1996, the Land Board approved the State Forest Land Management Plan (SFLMP). The SFLMP provides the philosophy adopted by DNRC through programmatic review (DNRC, 1996). The DNRC will manage the lands in this project according to this philosophy, which states:

Our premise is that the best way to produce long-term income for the trust is to manage intensively for healthy and biological diverse forests. Our understanding is that a diverse forest is a stable forest that will produce the most reliable and highest long-term revenue stream... In the foreseeable future, timber management will be our primary tool for achieving biodiversity objectives.

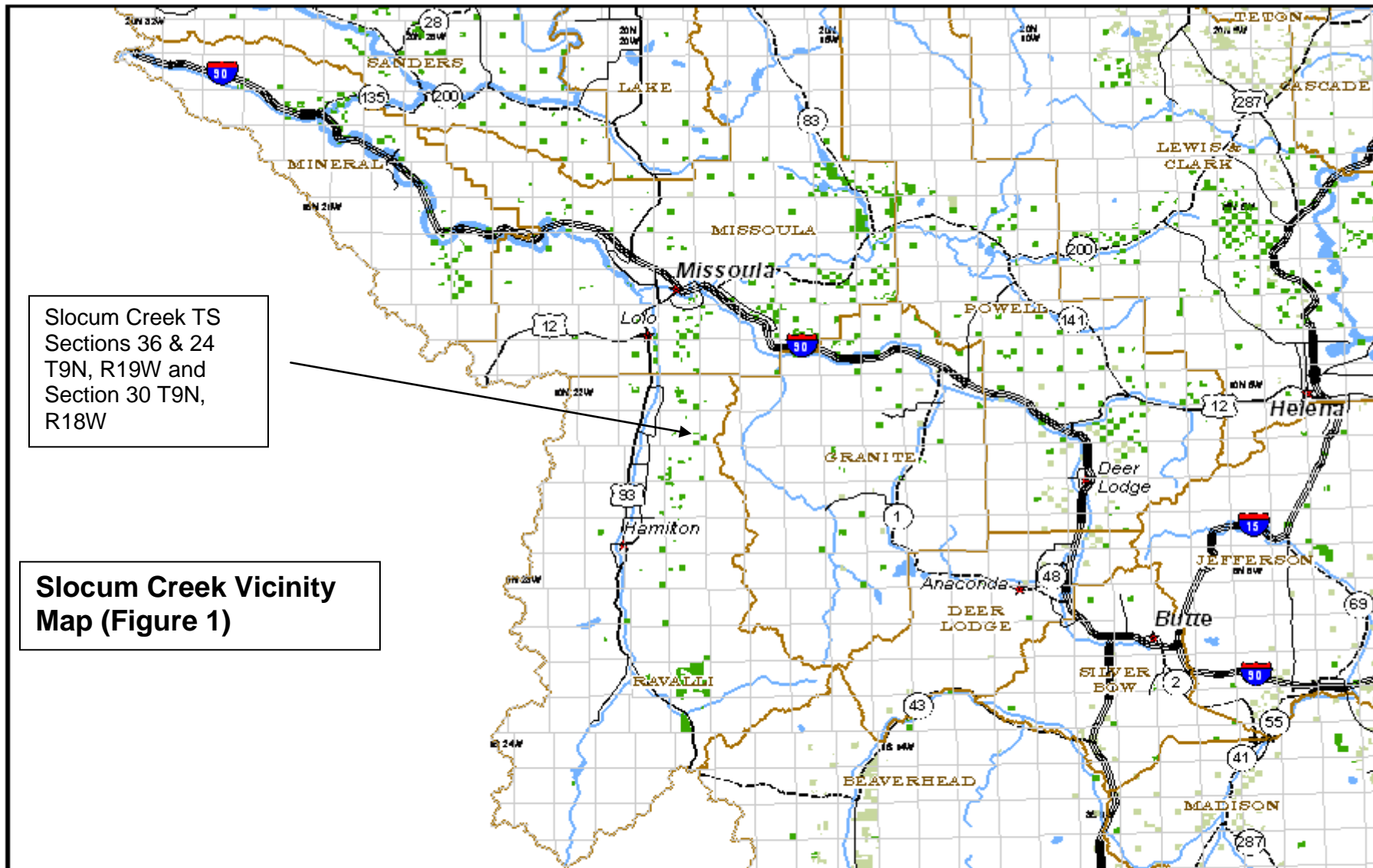
On March 13, 2003, the DNRC adopted Administrative Rules for Forest Management (Rules) (Administrative Rules of Montana [ARM] 36.11.401 through 450, DNRC 2003). The Rules provide DNRC personnel with consistent policy, direction, and guidance for the management of forested trust lands. Together, the SFLMP and Rules define the programmatic framework for this project.

The DNRC intends to manage these parcels for healthy and biologically diverse forests by managing toward more natural and historic stand structures and by reintroducing fire, where feasible, which is a natural process that these forest types evolved with and has been basically absent for the past century. The proposed harvests are designed, in part, to reflect the historical roles that fire played in the cover

types that are represented. The proposed management regime for these parcels is to develop age class structures that would maximize long-term return to the school trust. The DNRC would plan to reenter these parcels as needed to harvest forest products and manage the stands for this long-term return. Intermediate entries such as thinning, salvages, and maintenance projects may also be needed to fulfill these goals.

DNRC is managing the habitats of threatened and endangered species on this project by implementing the Montana DNRC Forested Trust Lands Habitat Conservation Plan (HCP) and the associated Incidental Take Permit (Permit) that was issued by the United States Fish & Wildlife Service (USFWS) in February of 2012 under Section 10 of the Endangered Species Act. The HCP identifies specific conservation strategies for managing the habitats of grizzly bear, Canada lynx, and three fish species: bull trout, westslope cutthroat trout, and Columbia redband trout. This project complies with the HCP.

1.2.1 Vicinity Map



Slocum Creek TS
Sections 36 & 24
T9N, R19W and
Section 30 T9N,
R18W

**Slocum Creek Vicinity
Map (Figure 1)**



21 February 2007
Montana DNRC
Technical Services Section/dr



1.3 OBJECTIVES OF THE SLOCUM CREEK TIMBER SALE PROJECT

In order to meet the goals of the management philosophy adopted through programmatic review, the DNRC has set the following specific project objectives:

1. Maximize revenue over the long-term for the School Trust accounts from the timber resources and provide a sufficient amount of sawlog volume to contribute to the DNRC's sustained yield as mandated by State Statute 77-5-222, MCA.
2. Manage the identified parcel intensively for healthy and biologically diverse forests to provide long-term income for the Trust.
3. Improve timber stand growth and vigor.

1.4 COOPERATING AGENCIES AND ENTITIES WITH JURISDICTION AND REQUIRED PERMITS

- **The Montana Streamside Management Zone (SMZ) Law** - Administered by the Department of Natural Resources and Conservation (DNRC) would be adhered to when operations occur near streams.
- **Open Burning Regulations** - DNRC is classified as a major open burner by the DEQ, and is issued a permit from the DEQ to conduct burning activities on state lands managed by the DNRC. As a major open burning permit holder, DNRC agrees to comply with all of the limitations and conditions of the permit.
- **Incidental Take Permit** - In December 2011, the U.S. Fish and Wildlife Service issued an Incidental Take Permit under Section 10 of the Endangered Species Act. The Permit applies to select forest management activities affecting the habitat of grizzly bear, Canada lynx, and three fish species — bull trout, westslope cutthroat trout, and Columbia redband trout — on project area lands covered under the HCP. DNRC and the USFWS will coordinate monitoring of certain aspects of the conservation commitments to ensure program compliance with the HCP.
- **124 Permits** - Administered by the Department of Fish Wildlife and Parks, to protect and preserve fish and wildlife resources and to maintain streams and rivers in their natural or existing state. This permit would be needed for the replacement of an existing culvert and the installation of a new culvert on a class 1 stream
- **Temporary Road Use Permits** - Would be obtained from private land owners and the USFS.
- **The Clean Water Act and Environmental Protection Agency Water Quality Planning and Management Regulations** - Require the determination of allowable pollutant levels in 303(d) listed streams through the development of Total Maximum Daily Load (TMDL) limits. Slocum Creek is not on the 303(d) list. Only streams partially supporting aquatic life and cold water fisheries are listed.

1.5 OTHER RELEVANT ENVIRONMENTAL REVIEWS IN THE AREA

In order to address direct, indirect, and cumulative effects on resources, the analysis incorporates past, present, and future actions within a determined analysis area. The locations and sizes of the analysis areas vary by resource (watershed, soils, etc.) and species (grizzly bear, big game, etc.) and are further described by resource in Chapters 3 and 4. Effects from past projects are incorporated into DNRC databases over time and become part of the existing condition that is used in each analysis. Ongoing and proposed projects are considered for each resource based on the appropriate analysis area.

The following environmental reviews were located within analysis boundaries for the project.

- Department of Natural Resources & Conservation, Hamilton Unit Office, 1985; Environmental Analysis for the Slocum Creek Timber Sale.
- United States Department of Agriculture, Bitterroot National Forest, Stevensville Ranger District; August 2010, Three Saddle Vegetation Management Project.
- United States Department of Agriculture, Bitterroot National Forest, Stevensville Ranger District; March 2008, Haacke Claremont Vegetation Management Project..

1.6 DECISIONS TO BE MADE

The Decision Maker will determine the following from this EA and will document their decision in the Finding found at the end of the document.

- Should the project be implemented or should an EIS be prepared?
- Do the alternatives presented in the EA meet the purpose of the project?
- Which alternative should be implemented?
- Are the proposed mitigations adequate and feasible?
- Does the selected alternative have a significant effect on the human environment?

These decisions would become DNRC's recommendations to the Land Board. The Land Board will make the final decisions regarding implementation of actions.

1.7 SCOPE OF THE ENVIRONMENTAL ANALYSIS

This section defines and explains the scope (boundaries/limits) of the Slocum Creek Timber Sale Project. It briefly describes the history of the planning process, identifies the resource issues studied in detail, and identifies the issues eliminated from detailed study.

1.7.1 Public Scoping Process

The initial stage of an Environmental Assessment (EA) is the public scoping process, which is used to inform the public that a State agency is proposing an action and gather comments on the possible impacts of the project. The scope of this was determined by the professional judgment of resource specialists in DNRC, other State agencies, comments from the public, and other interested parties.

The Slocum Creek timber sale was initially scoped for public comments January 3rd of 2011 through distribution of a letter to individuals, adjacent landowners, organizations, industries, and agencies. Notices were also posted in local newspapers. The mailing list of parties receiving initial scoping notices for this project is located in the project file at the Hamilton Unit Office. Public scoping comments as well as internal DNRC issues and concerns were summarized and can be found below. The original comments are also located in the project file at the Hamilton Unit Office.

1.7.2 Issues Studied in Detail

The Slocum Creek ID team carefully considered comments received from DNRC resource specialists, the public, and other agencies. Through the scoping process, concerns were raised about the project's potential impacts on the environment. These comments and concerns were considered by DNRC in the development of project alternatives (see CHAPTER 2). The Project File contains additional details of scoping and issue identification. For the purposes of this environmental analysis, issues will be considered actual or perceived effects, risks, or hazards as a result of the proposed alternatives.

Issues were grouped by general resource area (Vegetation, Soils, Hydrology, etc.) and are listed below. Italicized comments clarify where an issue may be addressed under several resource areas. See Chapters 3 and 4 for more detailed descriptions and on relative importance of these issues and concerns.

The following issues were identified for detailed study:

Vegetation

- There are concerns that overstocking in forest stands may increase competition stress, risk of insect and disease outbreaks, mistletoe severity and spread, and risk of high intensity wildfire.
- Slash from timber harvest activities could increase fire hazard and could make the site look displeasing. The visual component of this issue will be addressed as part of the aesthetics analysis.

Soil Resources/Geology

There is a concern that the proposed forest management activities may adversely affect geologic or soil resources through excavation, excessive disturbance/ displacement or compaction

depending on extent and degree of harvest related soil impacts.

Noxious Weeds

- Noxious weeds- There is concern that the proposed forest management activities may introduce or spread noxious weeds and that disturbed areas should be reseeded.

Water Quality

- There is a concern that timber harvest and road use/construction may increase sediment delivery to streams and may adversely affect water quality.

Cumulative Watershed Effects

- There is a concern that the proposed timber harvest may cause or contribute to cumulative watershed impacts as a result of increased water yields.

Fisheries

- The proposed forest management actions may have effects to fisheries and fish habitat features principally from sedimentation.

Wildlife

- There is concern that the proposed activities could alter cover, increase access, and reduce secure areas, which could affect grizzly bears by displacing them from important habitats and/or increasing risk to bears of human-caused mortality.
- There is concern that the proposed activities could negatively affect Canada lynx by altering lynx summer foraging habitat, winter foraging habitat, and other suitable habitat, rendering it unsuitable for supporting lynx.
- There is concern that the proposed activities could reduce the amount and/or quality of fisher habitats, which could alter fisher use of the area.
- There is concern that the proposed activities may alter flammulated owl habitat by reducing canopy closure and increasing tree spacing, and could remove snags needed by flammulated owls for nesting.
- The proposed activities could displace gray wolves from important habitats, particularly denning and rendezvous sites, and/or alter prey availability.
- There is concern that the proposed activities could reduce suitable nesting and foraging habitat for pileated woodpeckers, which could alter pileated woodpecker use of the area.
- There is concern that the proposed activities could remove forest cover on big game winter range, which could reduce the carrying capacity of the winter range
- There is concern that the proposed activities could remove elk security cover, which could affect hunter opportunity and the quality of recreational hunting in the local area.

Aesthetics

- The proposed project could change the aesthetics in the area.

1.7.3 Issues Eliminated from Detailed Study

The following species were considered but eliminated from detailed study due to lack of habitat present: bald eagle, black-backed woodpecker, Coeur d'Alene salamander, Columbian sharp-tailed grouse, common loon, harlequin duck, mountain plover, northern bog lemming, peregrine falcon, and Townsend's big-eared bat. Thus there would be a low risk of adverse direct, indirect, or cumulative effects as a result of either alternative.

Sensitive Plants

A search of the Montana Natural Heritage Program was conducted and no sensitive plants were identified in the analysis area. In field reconnaissance, DNRC personnel have identified no sensitive plants. Since no sensitive plants have been identified on the project area, no direct, indirect, or cumulative effects are expected to occur.

Old Growth

A concern was raised that the proposed harvest area would remove old growth trees. A site visit was conducted by the Trust Lands Area Silviculturist. It was determined the area did not meet the Green et al. (1992) minimum criteria used to identify old growth on State lands.

Cultural Resources

A concern was raised that proposed activities might affect cultural or archeological sites within the project area. The State Historic Preservation Officer was consulted in an effort to determine whether or not cultural resources exist in the project area. No cultural resources identified within the project area.

CHAPTER 2: ALTERNATIVES

2.1 INTRODUCTION

Chapter 2 describes the alternatives developed and considered for the Slocum Creek Timber Sale Project. This chapter will introduce a no action alternative and an action alternative. It contains summaries and comparisons of each alternative.

2.2 DEVELOPMENT OF ALTERNATIVES

The initial scoping and intent of this project is to treat three parcels of state ownership to achieve the objectives of generating income for the school trust and maintaining long term forest health and productivity. This proposal included the removal of approximately 2.1 MMBF on 1,320 acres.

The action alternative will consider management activities on approximately 450 acres and allow the construction of approximately .69 miles of new road construction, 1.3 miles of road reconstruction and .4 miles of road abandonment.

It was concluded that the action alternative found a balance between resource concerns and project objectives that would be acceptable to the interdisciplinary team and the decision maker.

2.3 ALTERNATIVE DESCRIPTIONS

This section describes the elements and mitigation measures of the action alternative, and also includes a description of No Action Alternative A. If the action alternative is chosen, actions designed to protect resources during harvesting, road construction, or site preparation activities would be incorporated into a timber sale contract as contract specifications and stipulations. These specifications and stipulations would be applied to the action alternative and are a form of mitigation. Mitigation measures that were designed to reduce impacts on a particular resource are discussed in section 2.3.3 of this chapter and in Chapters 3 and 4 under the particular resource.

2.3.1 No Action Alternative

No Action Alternative A is used as a baseline for comparing the effects that the action alternative would have on the environment. It is also considered a reasonable alternative for selection.

Timber harvesting as proposed would not occur and roads would not be built. Future harvest of wood products might occur to an unknown degree, depending on project proposals and environmental analyses.

Recreational uses of the area, both general and special would continue. Fuels mitigation and weed control efforts would continue as funding and priorities allow.

Effects of Mountain Pine Beetle (*Dendroctonus ponderosae Hopkins*) would likely continue for several years at epidemic levels. In addition high levels of the Western Spruce Budworm (*Choristoneura occidentalis*) within the project area will likely continue to reduce tree growth and productivity.

2.3.2 Action Alternative

The action alternative is designed to improve individual tree growth & vigor and overall timber stand productivity within the project area as a necessary means for providing revenue generating opportunities in the future. This alternative is based on the trust mandate, principles of the State Forest Land Management Plan and the Administrative Rules, as well as other laws and/or rules applicable to timber harvesting activities.

The action alternative would harvest timber from 450 acres within the project area. Silvicultural treatments would include Individual Tree Selection on 353 acres; trees would be thinned across all age classes to encourage uneven aged stands to improve tree health and growth. This would occur by removing poor quality trees as well as those infested by mountain pine beetle or infected with dwarf mistletoe to create growing space for the residual trees. The action alternative would remove trees infected with Mountain Pine Beetle, (*Dendroctonus ponderosae Hopkins*) and Douglas-fir dwarf mistletoe, (*A. douglasii Engelm*).

A Sanitation and Sanitation/Salvage harvests would also occur on 97 acres to remove trees infected by Douglas-fir mistletoe and Mountain Pine Beetle, (*Dendroctonus ponderosae* Hopkins).

Roadwork would occur in section 30 T9N R18W and would include .69 miles of permanent new construction and 1.3 miles of reconstruction to provide for long term management. In addition, .4 miles of existing road adjacent to Slocum Creek would be abandoned by removing 2 culverts, scarifying, grass seeding, and slashing the road prism to prevent further use. The .69 miles of new road would be closed year long to motorized vehicle use to the public.

Figure 2-0 Slocum Creek Action Alternative 1 of 2

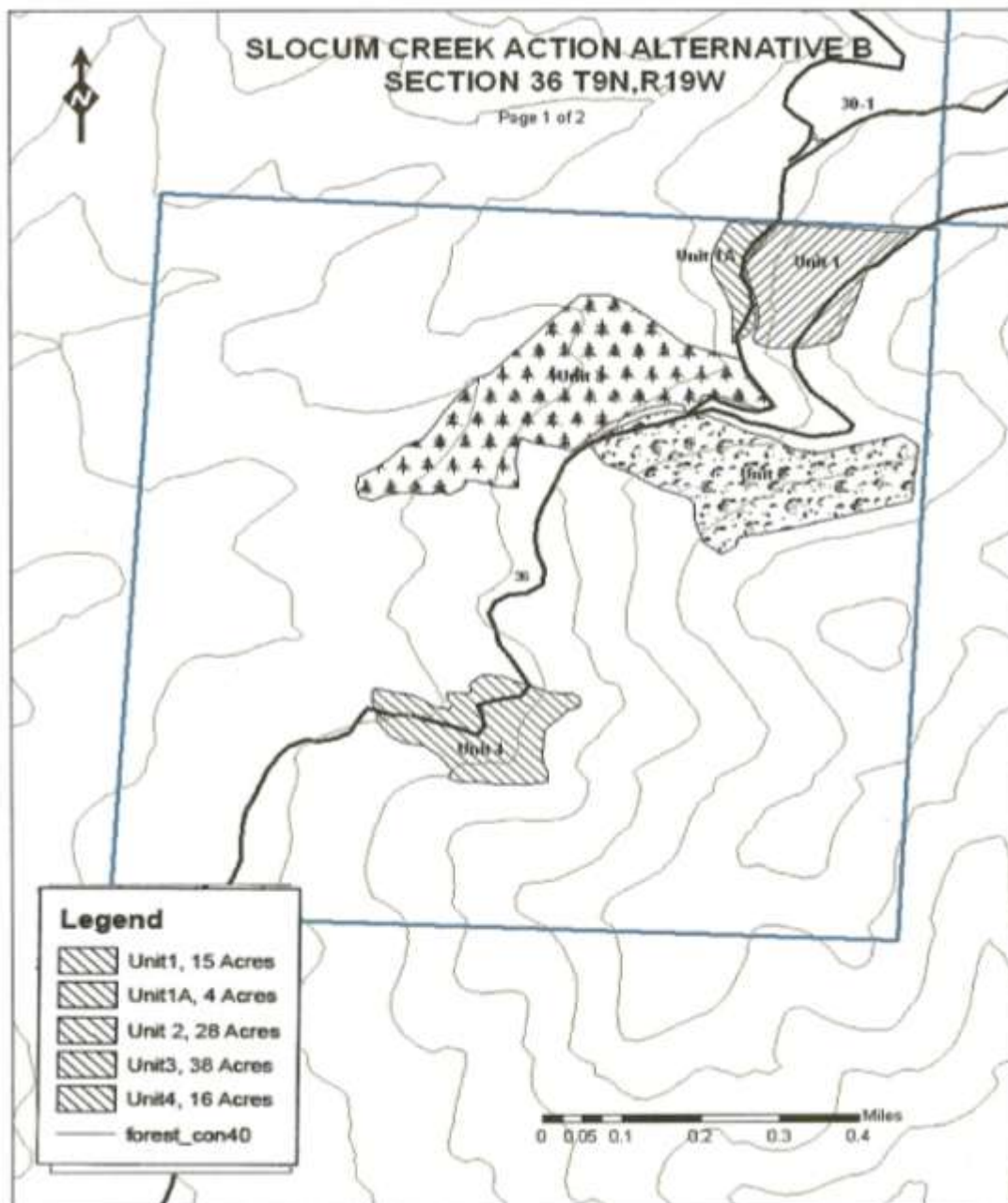
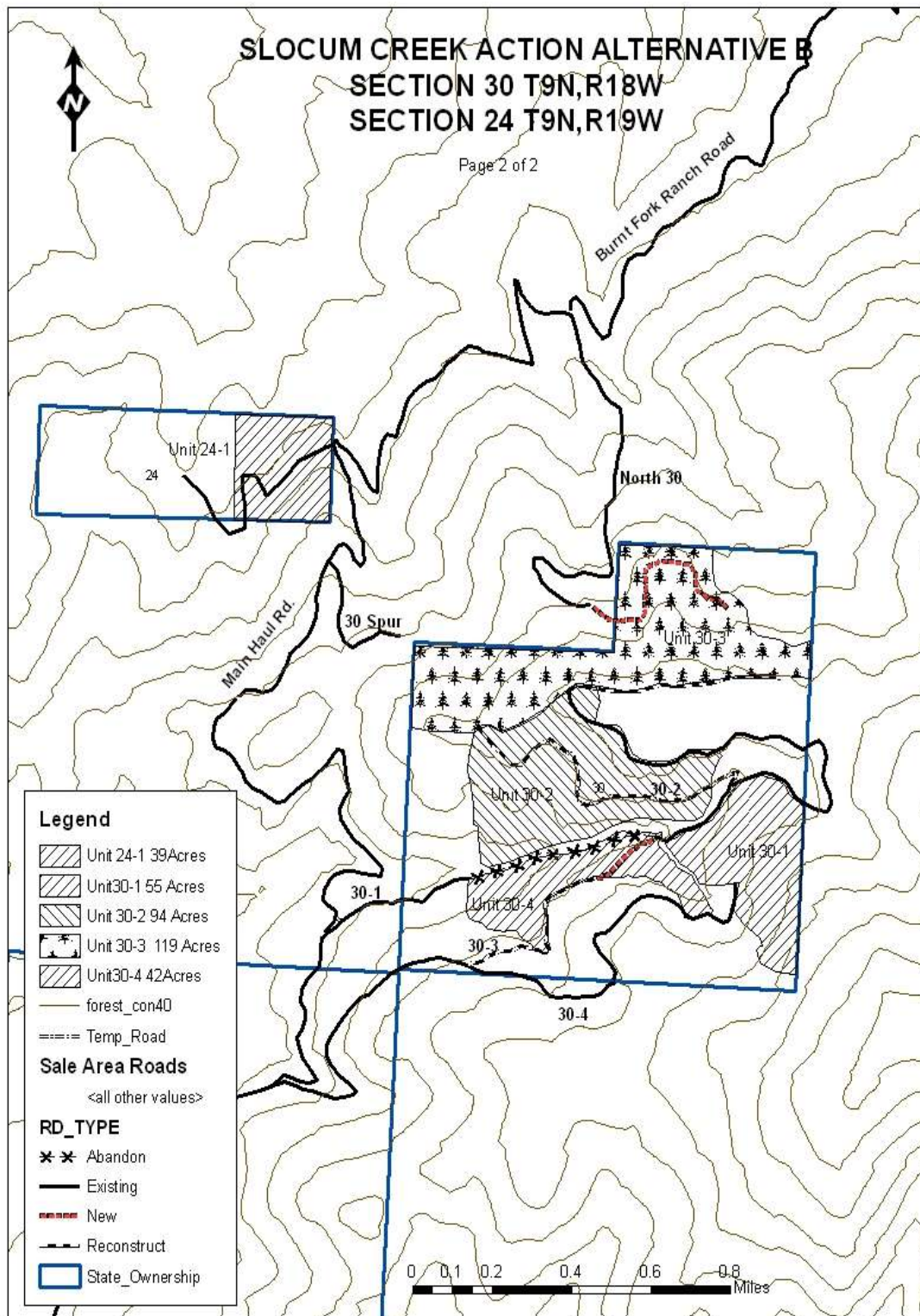


Figure 2-0 Slocum Creek Action Alternative 2 of 2



2.3.3 Mitigation Measures of Action Alternative

The following mitigations would be included as part of the action alternative:

Vegetation

- Grass seed new and disturbed roads and landings; spot spray new weed infestations.
- Washing logging equipment prior to use.
- Slash placement in skid trails.
- Treating existing weed populations along or within roads with herbicide spray.

Watershed and Soils

- Upgrade roads to incorporate Forestry Best Management Practices (BMPs) for adequate road drainage and maintain concurrent with hauling operations. If cutslope or fillslope slumps occur, they will be stabilized within the course of the harvest project to control erosion.
- Promptly seed disturbed soil on reconstruction sites and disturbed soils with site adapted grasses to reduce weed encroachment and stabilize roads from erosion.
- Mark and maintain Streamside Management Zone (SMZ) consistent with applicable rules and regulations.
- Within Section 30 T9N, R18W locate a 50 ft. no cut harvest boundary along Slocum Creek and a 93 ft. Riparian Management Zone (RMZ) where 50% of representative standing trees would be retained.
- Implement BMP's in all forest harvest operations.
- Season of use- Limit equipment operations to periods when soils are relatively dry, (less than 20%), frozen or snow covered to minimize soil compaction and rutting, and maintain drainage features. Check soil moisture conditions prior to equipment start-up. Avoid dispersed skidding unless on snow or frozen ground. The access road to the north has clayey road segments that tend to remain wet later into the spring and requires strict adherence to dry or frozen season of use to limit impacts in harvest units or damage to roads and the extent of gravel needed. Some moister conditions are accepted on harvest units where tractors remain on designated trails and timber will be felled and bunched or winched to trails, and the trails are stabilized and have erosion controls implemented.
- Skid Trail Planning- On tractor harvest units the logger and sale administrator will agree to a general skidding plan prior to equipment operations to limit trails to 15% or less of the harvest unit. Prefer use of existing skid trails, unless too steep. Feller-bunchers may work on slopes up to 45% as long as displacement and turning is minimized to prevent excessive disturbance.
- Leave 5-15 tons of fine litter and large woody debris for organic material for nutrient cycling. On some light harvest sites, it may not be possible to leave 10 tons of slash, in which case, a proportion of fine slash and as much downed woody material as feasible while meeting slash law requirements. Consider lop and scatter, jackpot burning or excavator piling on steeper slopes over 35%.
- Road condition and drainage will be improved principally by maintenance grading; spot gravel surfacing or turnpiking short reaches across potholes as needed to comply with BMP'S.
- Construct and maintain erosion control features on trails and roads where needed. For skid trails on slopes, install waterbars or well distributed slash on trails as needed to control erosion. Minimal effects are expected with snow road construction. Road drainage should be installed at initial entry and prior to soil freeze-up.

- Limit hauling operations to periods when soils are adequately, dry, frozen or snow covered. Road use for even short durations when wet can cause rutting that requires considerable maintenance to repair drainage features. Dust can be minimized by; operating on frozen ground, applying water or MgCl₂ if needed.

Weed Management

To reduce current noxious weed infestations and limit the spread of weeds the following integrated weed management mitigation measures of prevention and control would be implemented:

- All road construction and harvest equipment would be cleaned of plant parts, mud and weed seed to prevent the introduction of noxious weeds. Equipment would be subject to inspection by forest officer prior to moving on site.
- Revegetate all newly disturbed soils on road cuts and fills promptly with site-adapted grasses (including native species) to reduce weed encroachment and stabilize roads from erosion. For grass seeding to be effective it is important to complete seeding concurrent with road construction.
- Weed treatment measures include herbicide and/or biological applications along portions of project roads and accessible sites with a priority on spot outbreaks of noxious weeds and as designated by the forest officer. Any restricted use herbicide treatments would be implemented by a certified applicator according to herbicide label directions in accordance with applicable laws and rules.
- DNRC would monitor the project area for two years. If new infestations of noxious weeds were noted, a weed management plan would be developed and implemented with the lessee.

Wildlife

- A DNRC biologist will be consulted if a threatened or endangered species is encountered to determine if additional mitigations that are consistent with the administrative rules for managing threatened and endangered species (ARM 36.11.428 through 36.11.435) are needed.
- Motorized public access will be restricted at all times on restricted roads that are opened for harvesting activities; motorized public access would revert to existing levels following harvesting. Efforts to discourage additional motorized access (legal and illegal) by reclaiming temporary roads and obstructing skid trails would benefit several wildlife species.
- Snags, snag recruits, and coarse woody debris will be managed according to *ARM 36.11.411* through *36.11.414*, particularly favoring western larch and ponderosa pine. Clumps of existing snags would be maintained where they exist to offset areas without sufficient snags. Coarse woody debris retention would emphasize retention of downed logs of 15-inch diameter or larger.
- Contractors and purchasers conducting contract operations will be prohibited from carrying firearms while on duty.
- Food, garbage, and other attractants will be stored in a bear-resistant manner.
- Retention of patches of advanced regeneration of shade-tolerant trees, such as grand-fir, in units 30-1, 30-3, and 30-4 would break-up site distances, provide horizontal cover, and provide forest structural attributes preferred by snowshoe hares and lynx.
- Provide connectivity for fisher, Canada lynx, grizzly bears, and a host of other species by maintaining corridors of un-harvested and/or lighter harvested areas along riparian areas, ridge tops, and saddles.

2.3.4 Action Alternative

Action Alternative would apply silvicultural treatments to a total of 450 acres, harvesting approximately 13,686 tons (~ 2.1 million board feet). Excess logging slash created on the site would be piled and burned when environmental conditions and State Smoke Monitoring regulations allowed.

This alternative would include approximately .69 miles of new road construction to provide for long term access. All roads would continue to be closed year long to motorized use using existing gate closures.

2.4 SUMMARY COMPARISON OF ALTERNATIVES

Each alternative is unique in terms of activities, achievement of project objectives, and effects that would occur. This section presents key characteristics of the alternatives, using tables to display differences and make comparisons. The following table provides a brief comparison of on-the-ground activities that would occur if Alternative A or B were implemented.

Table 2-1: Summary Comparison of Project Activities for Each Alternative

Alternative	MBF Harvest	Acres Harvested	Acres by Harvest Method	Road Management
No Action Alternative A	0 MMBF	0	0	Miles new road: 0 Miles of road re-construction: 0 Miles of road abandonment: 0
Action Alternative B	2.1 MMBF	~450	Individual Tree Selection, ~353 ac; Sanitation/Salvage, ~97 ac.	Miles New road ~.69 Miles Road Re-Construction ~1.3 Miles of Road Abandonment ~.40

Table 2-2 displays a comparison of how each alternative would meet the project objectives identified in Chapter 1. Those are:

1. Maximize revenue over the long-term for the School Trust accounts from the timber resources and provide a sufficient amount of sawlog volume to contribute to the DNRC's sustained yield as mandated by State Statute 77-5-222, MCA.
2. Manage the identified parcel intensively for healthy and biologically diverse forests to provide long-term income for the Trust.
3. Improve timber stand growth and vigor.

Table 2-2: Summary Comparison of Achievement of Project Objectives

Objective	Indicators:	No Action Alternative:	Action Alternative:
Generate revenue for both Public Building (PB) and Common School (CS) grants.	Stumpage receipts dollars; (CS)	\$0	\$142,882
	Stumpage receipts dollars; (PB)	\$0	\$21,350
	Forest Improvement Fee	\$0	\$48,996

	Grazing Revenue	\$1,825	\$1,825
	Sawlog Volume (MMBF)	0	2.1 MMBF
Manage intensively for healthy and biologically diverse forests to provide long-term income for the trust.	Acres converted to desired future condition	0	16
Improve timber stand growth and vigor.	Acres treated improve health and vigor	0	450

The revenue information in Table 2-2 is an estimate. Costs, revenues, and estimates of return are estimates intended for relative comparison of alternatives. They are not intended to be used as absolute estimates of return. The estimated stumpage is based on comparable sales analysis. This method compares recent sale bids to find a marked value for stumpage. The estimated volume, based on stand inventory data, was multiplied by the estimated stumpage to predict revenue values. The action alternative was estimated to sell for \$12.00 per ton plus an additional \$3.58 per ton for Forest Improvement fees (FI). These values are based on comparable timber sale bids on the Hamilton Unit from the last two years. A conversion factor of 6.34 tons per MBF was used as an estimate.

CHAPTER 3: EXISTING ENVIRONMENT

3.0 INTRODUCTION

This chapter identifies and describes those resources that may be affected by the proposed action, and is organized by general resource categories and their associated issues introduced in Chapter 1. It does not describe any effects of the alternatives, as those will be covered in Chapter 4. The descriptions of the existing environment found in this chapter can be used, as a baseline for the comparisons in Chapter 4.

3.1 GENERAL DESCRIPTION OF THE AREA

The proposed Slocum Creek Timber Sale is located in the Sapphire Mountains approximately 9 miles east of Stevensville, Montana. Elevations in the project area vary between 4,600' and 6,000'. These parcels are a tributary to both Slocum Creek and Ambrose Creek. The trust lands involved in the proposed project are forested and non-forested. Adjacent landowners are: the Burnt Fork Ranch, Stevensville Future Farmers of America (FFA), USDA Forest Service, and several smaller private property owners.

3.2 EXISTING ROADS

Section 36

This 640 acre parcel has 2.8 miles of existing roads located within the section. Most of the roads are graveled and well maintained with the exception of a few road segments with native material. No additional roads would be planned under the action alternative. Access gained to this section would be through a temporary road use permit granted by the Burnt Fork Ranch.

Section 30

There are currently 4.3 miles of existing roads within this section on State ownership. If the action alternative is selected, an additional .69 miles of new construction and .40 miles of road abandonment would occur. In addition 1.3 miles of road reconstruction would also take place. Existing roads when completed would be 4.6 miles; all roads within this section are closed yearlong to motorized use by the general public (See Figure 2-0, Action Alternative 2 of 2 in Chapter 2).

Section 24

This 120 acre parcel has .72 miles of existing roads located within the ownership. No road changes are planned for the action alternative.

3.3 EXISTING CONDITIONS OF VEGETATION

The vegetation section describes present conditions or components of the forest in order to address the potential effects of proposed alternatives in Chapter 4. Issues expressed during initial scoping by the public and internally are:

- If the proposed action does not take place, timber stand health could continue to decline with increased risk of insect and disease outbreaks, and increased competition stress from overstocking.
- If the proposed action does not take place, risk of high intensity stand replacing fires would continue to increase.
- Slash from timber harvest activities could increase fire hazard and could make the site look displeasing.
- Additional road building and commercial logging will have cumulative impacts that will threaten the biological diversity of the local ecosystem through loss of habitat; introduction of weeds.

Analysis Area

For the vegetative related resources the cumulative effects analysis area includes all state ownership in the project proposal and all those lands within one mile of the sections including private lands.

3.4 GENERAL FOREST STRUCTURE AND HISTORIC STAND CONDITIONS

The forested areas are comprised of primarily ponderosa pine and Douglas-fir. The most common forested habitat types present are (Psme/Syal/Caru), Douglas-fir/snowberry, Basal area stocking is good in the Syal and Caru phase (Pfister et.al., 1977). The north aspects are primarily heavily stocked and are dominated by Douglas-fir (*Pseudotsuga menziesii*) interspersed with Ponderosa pine, Subalpine fir (*Abies Lasiocarpa*), Western Larch (*Larix occidentalis*) and Lodgepole pine *Pinus contorta*). These stands are generally one-storied but are sometimes two and three-storied. The south aspects are generally more open and dominated by ponderosa pine, with a prevalence of young Ponderosa pine and Douglas fir understory. Regeneration and sapling size trees are common in the two and three-storied stands throughout the project area.

In the project area, comparing the current forest cover type to DNRC's desired future condition reveals that there is excess acreage in the project area in the Douglas-fir and mixed conifer cover types, and a deficiency of ponderosa pine and western larch/Douglas-fir (see table below).

COVER TYPE	Pre-Treatment (Current Cover)		Post-Treatment		DFC	
	Acres*	Percent*	Acres*	Percent*	Acres*	Percent*
Douglas-fir	181	14%	165	12%	107	8%
Mixed conifer	27	2%	27	2%	0	0%
Non-forest	322	24%	322	24%	322	24%
Ponderosa Pine	658	50%	674	51%	731	55%
Western Larch/Douglas-fir	133	10%	133	10%	159	12%
Grand Total	1320	100%	1320	100%	1320	100%

*Acres and percentages may not sum to total due to rounding.

In many locations typical understory vegetation historically consisted of ninebark, grouse whortleberry, huckleberries, etc. and a variety of herbaceous species e.g., pinegrass, arnica, aster, etc. (Pfister et al., 1977; Fischer and Clayton, 1983). Fire suppression has allowed the stands to develop a closed canopy condition and the spread of noxious weeds has caused a decline in many of these understory species. Ponderosa pine types within project area are experiencing encroachment by Douglas-fir. This is likely due to the lack of frequent fires, which historically kept the south and west aspects clear of all but some scattered individual Douglas-fir (Gruell et al., 1982). Occasional grasslands are found interspersed within forested areas on drier sites where soils are shallow and make it difficult for regeneration to become established.

The trust lands involved in the proposed harvest area total approximately 450 acres of forested ground. General stand vigor ranges from poor to good with the majority of the area being in the moderate to fair range. Douglas-fir mistletoe infects many of the trees on the north aspects and is causing very poor health, decreased growth rates, and some mortality of infected trees. Mountain pine beetle are present with epidemic levels across the parcel.

At the broad scale, assessments prepared for the 1997 Interior Columbia River Basin (ICRB) Draft EIS are useful in examining how DNRC's ownership fits into the larger ecosystem. The information in the ICRB Draft EIS shows the general trend across the analysis area is a decrease of ponderosa pine, western larch, and western white pine across their ranges. The primary trend is from shade intolerant to more shade tolerant species (true firs, spruces, and western red cedar) with the shade intolerant species (ponderosa pine, lodgepole pine, and western larch) out competed and replaced by shade tolerant species. Fire regimes have changed from predominantly mixed and non-lethal severity to a large

predominance of lethal severity fires. Acres of old forests of both multistory and single story structure have decreased.

The ICRB EIS grouped forests into three broad categories:

- Dry - includes ponderosa pine, dry Douglas-fir, and dry grand fir forests.
- Moist – includes cedar/hemlock, moist Douglas-fir, grand fir, and wet spruce/fir forests.
- Cold – includes the higher elevation forests not falling into 1 of the other 2 categories.

All three forest groups have experienced large increases in dominance by shade-tolerant species due to timber harvesting, fire suppression, insects, and diseases. All three groups are more likely to experience stand replacing fires than they did historically due to a large buildup of fuels and changes in stand structure and composition. The majority of the stands in the proposed project area would fall in the Dry forest category.

3.4.1 Existing Condition of Stand Health

Section 36

This section is has a large component of non forested ground with Ponderosa pine encroachment occurring at the timber edge. Generally, the overall stand health across the timbered portion of the section is average. The Mountain Pine beetle (MPB) (*Dendroctonus ponderosae Hopkins*) is active within the stands and stocking is medium to low. Douglas-fir is found throughout the section and has a moderate to high infection rate of dwarf mistletoe. The age class of commercial sized timber ranges from 86-150 years, with an average diameter of 13". The most prevalent habitat type found within this section is *Pseudotsuga Menziesii* Climax Series and is a Douglas-fir Ninebark Phase.

Section 30

Generally, the overall stand health across the section is good to poor. The Mountain Pine beetle (MPB) has altered the structure within portions of the section where LP is the dominate species. Douglas-fir is found throughout the section and has a moderate to high infection rate of dwarf mistletoe experienced across all age classes. A component of older Ponderosa pine 160+ exists on portions of the section but does not meet the minimum characteristics of the old growth definition, 8 trees per acre 21" dbh or more. Spruce budworm the last three years were at epidemic levels, causing significant mortality and leader damage in the true-fir understory, however this year (2012) Spruce Budworm activity appears to have subsided. The most prevalent habitat types found within this section are *Pseudotsuga Menziesii* Climax Series and *Psme/Syal/Caru*.

Section 24

Generally, the overall stand health across the section is good to moderate due to past management activities that occurred within the east ½ of the section. Stand health on the proposed harvest area of the section is good to moderate in the Douglas-fir and moderate to poor in the ponderosa pine. Much of the Douglas-fir is suppressed with some trees infected with mistletoe while the Ponderosa Pine is being stressed by the last three years of Pine Butterfly attacks.

The two most significant factors affecting forest health and vigor on this parcel is the high levels of Mountain Pine beetle and the overstocking above the optimal levels in both even and uneven-aged stands.

The near exclusion of fire in the 20th century has likely affected many of the currently overstocked stands in the proposed project area. The Douglas-fir stand would have been expected to receive less frequent but moderate intensity fires that also would have had beneficial thinning effects that would improve forest health. These fires would have also been expected to keep the mistletoe at much lower levels as mistletoe is very susceptible to fire and tend to cleanse the stands of this disease.

3.4.2 Existing Fire Hazard and History

The most predominant historic fire frequencies in the project area occur on the warm, dry Douglas-fir and warm, dry Ponderosa Pine habitat types, which had a mean fire interval of around 5-25 years in pre-

settlement stands. Fire was an important agent in controlling density and species composition. Low to moderate severity fires converted dense stands of pole-sized or larger trees to a more open condition, and subsequent light burning maintained stands in a park-like state. Frequent low or moderate fires favored larch and ponderosa pine over Douglas-fir in stands where these species occurred. Severe fires probably occurred on dense, fuel-heavy sites and resulted in stand replacement. Stand replacement fires favored lodgepole pine on sites where this species was present (Fischer and Bradley, 1987). In the ponderosa pine dominated stands the fire frequency is expected to be on the shorter end of the range between fires and was typically a lower intensity event except in areas where fuels had built up or extreme weather conditions occurred.

Currently, the risk of a stand replacing fire or a fire that would burn more intensely than expected under natural conditions historically on the section is moderate. With the near exclusion of fire in the 20th century, stand dynamics, succession, and fuel loadings have all changed. With increased fuel accumulations on the forest floor, stand densities, and amounts of ladder fuels (especially Douglas-fir in the understory) in these stands, fires burning today are much more likely to be more intense. These more intense fires tend to replace entire stands that would not have typically been replaced historically often times with negative effects of soil damage, species composition changes, difficulty regenerating the site, and sometimes very unnatural conditions for entire drainages from those of historic conditions.

Should a fire start in the north facing Douglas-fir stands within the proposed sale area, the risk of a stand replacing fire would be quite high due to the large increase in the coverage and abundance of mistletoe. Mistletoe brooms are highly flammable and act as ladder fuels, which would help a fire, reach and carry through the crowns of the trees. Additionally, these stands are primarily on steep slopes, a factor that also helps to increase fire intensity. In the east, south, and west facing ponderosa pine stands the risk of a stand replacing fire has certainly increased to moderate to high due to the increase in stocking levels and ladder fuels. The large amounts of advanced regeneration provide fire with an avenue to reach the crowns of the otherwise fire adapted ponderosa pine and could cause substantial losses should the crown ignite.

Stand dynamics, succession, and fuel loadings have all changed over the past 100 years to create a situation that puts these forest stands at a much higher risk of high intensity and sometimes stand replacing fires. Past harvesting of trees has helped decrease fuel loadings and stand densities, but in many cases has removed the larger trees that are in most cases more fire resistant. In these locations, the risk of high intensity fires is still low to moderate due to decreased stocking levels, reduced amounts of mistletoe, and ladder fuels. However, should a fire get started, many of the larger trees that are more fire resistant have been removed in which case a higher rate of death of the over story trees could be expected than under historic conditions with the same intensity of fire.

A road inventory of existing roads on the haul route was completed to identify sediment sources and possible road repairs and mitigations as noted in the water resources section. On the existing access road there are (two) Class 1 stream crossings on unnamed tributary streams in the headwaters of the Ambrose drainage that do not comply with BMP's and require maintenance of road surface drainage. There is sediment delivery from the road surface due to inadequate drainage prior to the crossing sites and deferred maintenance of roads on this segment of private road.

3.5 SOIL AND GEOLOGIC ANALYSIS AREAS & METHODS

The analysis area for geologic and soil resources will be the proposed harvest, thinning units and existing and proposed roads used for hauling principally in Sections 30 T9N, R18W & Sections 24,36 T9N, R19W.

The analysis methods for disclosing soil impacts will assess that area of soils that may be affected by soil displacement, compaction, erosion or loss of surface organic materials. Geology maps were reviewed and the project field reviewed for unique or unstable geology. The cumulative effects analysis will consider the combination of impacts from past management and the alternatives. The analysis used general soil descriptions and management interpretations for each soil type derived from the Bitterroot Soil Survey (NRCS 2012) and verified on the project sites. Field reviews were completed by a soil scientist to verify soil and terrain conditions, assess past impacts of disturbance, displacement, compaction and erosion and levels of woody debris. Observations were incorporated into mitigation

measures to minimize direct, in-direct and cumulative effects to soils. The risk of adverse effects to soil resources resulting from the proposed action was qualitatively assessed using the soil property interpretations and terrain limitations and predicted effects based on with DNRC soil monitoring data (DNRC 2005) collected from previous timber sales.

3.5.1 EXISTING CONDITIONS-GEOLGY AND SOILS

The proposed forest harvest and tree thinning project would occur on mountain sideslopes of the Sapphire Mountains east of Stevensville. Primary geologic parent materials are Precambrian age argillites that form coarse textured gravelly and cobbly residual soils on mountain sideslopes in all of the project parcels. Bedrock outcrops are common on ridgelines and at shallow depth on convex slopes. Well fractured rock exposures of talus occur on the steep slopes in Section 30, on the north side of Slocum Creek, and this is a source for rock armoring where needed. Seasonal minor rock spalling occurs associated with freeze thaw cycles and rocks will roll onto roads. There is no especially unique or unstable terrain in the project area and no areas of slope instability or mass movements were identified during field review of the proposed harvest units and roads.

Tertiary age valley fill deposits form the footslopes above Ambrose Creek and Burnt Fork Creek. The tertiary deposits have a high content of clay and typically support range vegetation. Granitic bedrock occurs in the Ambrose Creek drainage along the Ambrose creek access road and localized areas.

Most material on proposed new road construction is common excavation, with the exception of a short segment of new road that may require ripping on the access route in the north end of section 30. Road surface erosion occurs along the existing roads, mainly on steep grades and where road drainage is not adequately spaced or requires maintenance.

Primary forest soils are described here and included with minor soils in table S-1 interpretations and on soil map in project file. Primary forest soils in Section 24, 36 and the southerly aspects of section 30 are mapping unit 31B39 Trapps-Wilde soils on 30-60 % slopes. Trapps soils are deep gravelly loam with very gravelly clay loams @ 18-34" depth. Wilde soils are moderate to deep very gravelly sandy loams from Quartzite. These soils support mixed forest stands of Douglas-fir and Ponderosa pine with dry site shrub and grass understory. Soils tend to be droughty and vegetation competes with regeneration of trees. These are well drained soils and well suited to ground based operations on slopes up to 45%. There is a moderate risk for compaction and displacement and high risk on slopes over 45%. Slopes over 45% can be feasibly harvested with cable or excaliner systems with minor effects based on DNRC monitoring (DNRC 2005).

Northerly aspects in section 30 are primarily map unit 32B/D-35 Klotch-Helmville complex on the northerly aspects with 20-40% slopes in section 30. Klotch soils have a cobbly volcanic ash influenced surface 2-6 inches depth over deep very gravelly sandy loams derived from quartzite. Helmville soils have a cobbly volcanic ash influenced surface 3-5 inches depth over deep very cobbly loam and clay loams from dolomite limestone. These soils are very productive (Helmville slightly better), supporting larch, ponderosa pine, and Douglas-fir that is in part due to the volcanic ash surface soils. The volcanic ash silt surfaces also support competitive understory vegetation of shrubs and grasses that reduce surface erosion. Soil fertility and moisture holding capacity are relatively high, yet the convex slopes can be droughty and support more ponderosa pine. The gentle slopes less than 20% have poor bearing strength when wet, due to high clay content subsoils and are susceptible to compaction and rutting if operated on when wet. Erosion potential is low to moderate on the gentle slopes.

A small area of 61B-25 Klotch-Crawfish rocky breaklands occurs in section 30 north of Slocum Creek. The breakland unit 61B25 has common shallow soils and rock outcrops with some areas of included talus on the steeper slopes. These soils are well drained, and include drier sites of convex knolls and mountain sideslopes. These soils have a moderate risk of erosion due to the high rock component. Primary concerns are steep slopes limit operations to cable systems and the droughty nature of the site can make regeneration slow to establish, unless partial shade is retained.

Minor soils included within the above mapping units are somewhat poorly drained alluvial soils that form

narrow strips along and adjacent to stream bottoms on Slocum, and several unnamed tributary streams. In some locations these soils are too intermittent and small to map at the soil survey scale, but were identified on site locations to mark specific riparian management zones and wetlands.

Table S-1 Soil Interpretations – Slocum Project Area						
Map Unit	Mapping Unit Name	Soil Description	Erosion Potential	Displacement hazard	Compaction Hazard	Notes
30D-26	Klootch with short steep slopes 40-60%	Cobbly and very gravelly sandy loams from Quartzite	Mod to high on slopes >45%	High on slopes >45%	Low	Includes soil silt loam surface. Slope limits ground based skidding
31B-39	Trapps-Wilde Soils on 30-60% slopes	Trapps Gr. loam with vgr. clay loam @ 18-34" Wilde very gravelly sandy loams from Quartzite	Mod to high on slopes >45%	High on slopes >45%	Low	Includes soil silt loam surface. Slope limits ground based skidding over 45%
32D-35	Klootch-Helmville on 20-40%	Klootch very gravelly loams from Quartzite Helmville cobbly clay loam from limestone	Mod	Mod	High if wet	Moist productive soils with ash surface, Avoid displacement of surface
32 M-71	Holter Tolman Soils on 20-40% slopes	Holter Mod deep, vgr sandy clay loams Tolman shallow, vgr. Loams 18" deep	Mod	Mod	Low , droughty	Droughty, Avoid displacement of surface by season of use & skid trail planning
33B-35	Wilde-Trapps Soils on mountain uplands and ridge tops 2-20% slope	Very Gravelly loams from quartzite and limestone	Low / Mod	Mod	Low , droughty	Droughty sites Moist productive soil, Avoid displacement of shallow surface
61B 25	Kadygulch-Totelake-Sharrott Granitic Breaklands 60-80% & rubble	Kadygulch boulders, sandy loams Totelake vgr. sandy loams, Sharrott shallow, vgr. Loams 18" deep	High, steep, rocky	high on slopes >45%	Low, Rocky, Excessive drained	Limit operation to cable systems. South aspects have more shallow soil depth and rocks than typical

There is a moderate to high level of existing downed coarse woody debris across the proposed harvest units similar to historic conditions established (10-15 tons) by Graham et.al.(1984). In areas of tree mortality and insect damage, many trees have shed their needles, which help return organic matter and nutrients to the soil. Retaining vegetative cover and woody debris helps to control erosion on disturbed sites and provide media for healthy soil fungi and conservation of soil nutrients important to forest growth.

3.5.2 Effects of Past Management

There have been previous harvest entries into this area that included selective, seed tree and shelterwood harvests that occurred in the 1950's and 1981. DNRC recognized the concern for soil effects

on the steeper slopes in the south half of section 30 and implemented mitigation measures during the last harvest that included designated skid trails, slope restrictions, and strict season of use limits. A DNRC field review was completed in 1981 during on-going operations and it was determined that the mitigations for the sensitive soils were effective, skid trails were stable and vegetated and operations had minimal effect on the ground. Soil impacts of displacement and compaction were principally limited to skid trails that occur on less than 10 % of the area.

3.6 WATER RESOURCES-ANALYSIS AREA & METHODS

Watershed Analysis

The primary concerns relating to water resources within the analysis area are potential impacts to water quality from sediment sources outside the stream channels as well as inside the channels. In order to address these issues the following parameters are analyzed for each alternative:

- ~Miles of new road construction and road improvements
- ~Potential for sediment delivery to streams
- ~Potential for water yield increase impacts to stream channel stability

A watershed analysis and field survey was completed by a DNRC hydrologist for the proposed sale area to determine direct, indirect and cumulative effects to water quality. The water quality evaluation included a review of existing inventories for soils and water resources (NRIS 2009), reference to previous DNRC projects, and comparisons of aerial photos combined with GIS analysis to estimate the area of past timber harvest and vegetative recovery. Field reviews were completed for the proposed harvest units, all existing and proposed access roads, and associated streams that may be affected. The observations, information and data were integrated into the watershed analysis and design of project mitigations.

Sediment Delivery

The analysis of sediment delivery is limited to the harvest units and roads used for hauling and will focus on the streams described. This includes in-channel and upland sources of sediment that could result from this project. In-channel areas include stream channels adjacent to roads and directly downstream of harvest areas. Upland sources include harvest units and roads that may contribute sediment delivery as a result of this project. Past management activities in the proposed project areas that affect sediment delivery include; timber harvest, mining, grazing, irrigation, road construction, fire suppression and recreation. For this project, a DNRC hydrologist evaluated streams, roads and proposed harvest units. The field review compared the current road conditions and repair needs to previous road inventories and planned road reconstruction and maintenance plans for the access roads to this project area.

Water Yield

The analysis for direct, indirect and cumulative effects to water yield considers the area of harvest units and roads within the project drainages described as the affected watersheds.

A DNRC hydrologist completed a course filter qualitative assessment of watershed conditions and cumulative effects concerning watershed management as outlined in the Forest Management Rules (ARM 36.11.423) and consistent with the DNRC Habitat Conservation Plan requirements. The analysis areas for watershed cumulative effects include the watersheds that wholly surround the DNRC project sections and the access roads to those parcels.

The analysis areas were designated using 6th code HUC scale or smaller watershed boundaries. The water resource analysis for; sediment affects to water quality, water yield and cumulative effects considered the Burnt Fork Creek, Slocum Creek and Ambrose Creek drainages (refer to Watershed Analysis Map WS-1). The proposed harvest units are included in the following DNRC managed lands:

- T9N, R18W, Section 30 parcel
- T9N, R19W, Section 24 parcel and Section 36

3.6.1 Affected Watersheds

The proposed harvest and thinning project area is located east of Stevensville, Montana. The project includes 81 acres in Section 24, T9N, R19W and the north third of section 30, T9N, R18W that are located within the headwaters of Ambrose Creek watershed HUC6 170102051502 which is 13251 acres in area. Section 30 straddles the ridgeline between Ambrose Creek and Slocum Creek/ Burnt Fork Creek. The south 2/3 of section 30 and section 36 are located within Slocum Creek drainage that is a tributary in the Burnt Fork-Bitterroot River-Stevensville (HUC6 170102051305) watershed. The Burnt Fork-Bitterroot River-Stevensville watershed is 21116 acres in area (refer to the project area watershed map W-S1).

3.6.2 Water Quality and Regulations

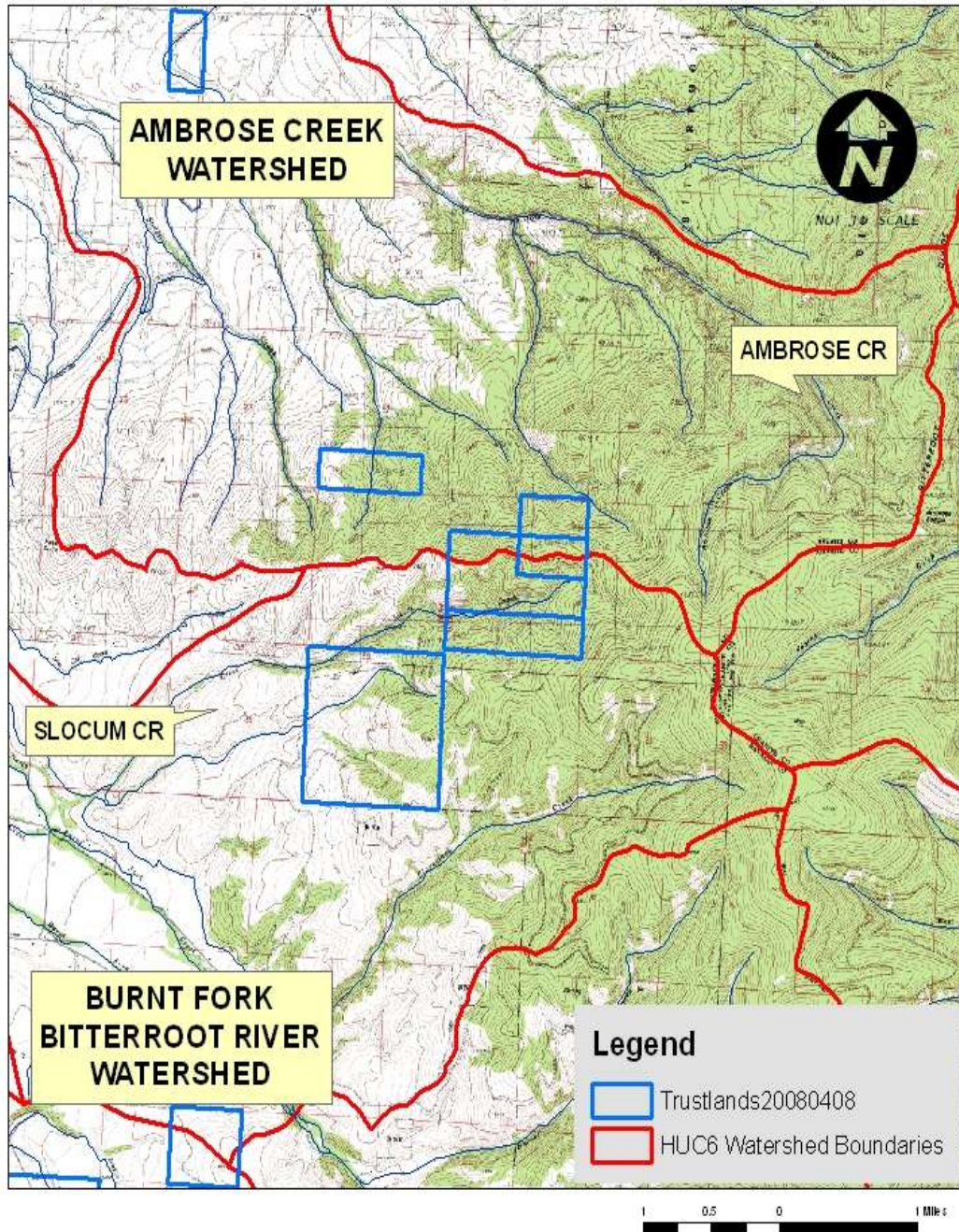
All the watershed areas listed in this report are classified as B-1 in the Montana Surface Water Quality Standards. The water quality standards for protecting beneficial uses in B-1 classified watersheds are described in ARM 17.30.623. The B-1 classification is for multiple use waters suitable for; domestic use after conventional treatment, growth and propagation of cold-water fisheries, associated aquatic life and wildlife, agricultural, and industrial uses. Other criteria for B-1 waters include; no increases are allowed above naturally occurring concentrations of sediment, which will prove detrimental to fish or wildlife. Naturally occurring includes conditions or materials present from runoff or percolation on developed land, where all reasonable land, soil, and water conservation practices have been applied. Reasonable conservation practices include methods, measures, or practices that protect present and reasonably anticipated beneficial uses. The State has adopted Forestry Best Management Practices through its Non-point Source Management Plan as the principle means of controlling non-point source pollution from silvicultural activities. DNRC provides further protection of water quality and fish through implementation of the Streamside Management Zone (SMZ) Laws and Forest Management Rules, but in this case there is no harvest adjacent to SMZ's.

3.6.3 Water Quality Limited Waterbodies & Beneficial Uses

Section 303(d) of the Clean Water Act directs Montana to list water quality impaired streams and develop total maximum daily loads to control non-point source pollutants that impact beneficial uses. Ambrose Creek (MT76H004_120) from the headwaters to the mouth is 11.7 miles in length and listed as water quality impaired for aquatic life and recreation. Probable causes of impairment are nutrients, (nitrogen and phosphorus), sedimentation/siltation and substrate alterations. Probable sources are agriculture and grazing in the riparian or shoreline zones. A TMDL has not been completed for nutrients, but has been completed for sediments (DEQ 2011).

North Burnt Fork Creek (MT76H004_200) from the confluence with South Burnt Fork Creek to the mouth on the Bitterroot River is 10.9 miles in length and listed as water quality impaired for nutrients (Nitrogen, phosphorus) and sediments as stream bottom deposits. Probable sources are agriculture and grazing in the riparian, shoreline zones. Slocum Creek is a tributary of Burnt Fork Creek, yet the Slocum Creek flow is intermittent near the mouth and all flow is diverted into an irrigation ditch and does not reconnect with the North Fork Burnt Creek. Slocum Creek which drains Section 36 and the southern 2/3 of section 30 is not listed as water quality impaired. A TMDL has not been completed for nutrients, but has been completed for sediments for Burnt Fork Creek (DEQ 2011).

MAP WS-1 DNRC Slocum Timber Sale Watershed Area
Parcels of Sec24 & 36 T9N, R19W and
Sec 30 T9N, R18W



Beneficial Uses The downslope beneficial uses in the area include: domestic surface water rights, recreation, cold-water fisheries, agriculture, industry, wildlife and livestock watering. Within the project sections, there is a grazing water right for a seep in the west ½ of the section 24 parcel, and no activities are planned near this area and no impacts are expected with this project.

Montana Streamside Management Zone (SMZ) Law

All rules and regulations pertaining to the SMZ Law will be followed. An SMZ width of 100 feet is required on Class I and II streams when the slope is greater than 35%. An SMZ width of 50 feet is required when the slope is less than 35%.

DNRC Forest Management Rules and Habitat Conservation Plan

All applicable State Forest Land Management rules and regulations regarding watershed and fisheries management will be followed. This includes, but is not limited to rules listed for water quality (ARM 36.11.422), cumulative effects (36.11.423) Riparian Management Zones (ARM 36.11.425), Fisheries (ARM 36.11.427) and Conservation Strategies outlined in the DNRC Habitat Conservation Plan (2011). The HCP applies to DNRC ownership in Section 24 and 30. Section 36 is classified grazing land and not covered by the HCP. As part of ARM 36.11.427(3)(a)(i) and (iv) and ARM 36.11.436, DNRC is committed to designing forest management activities to protect and maintain westslope cutthroat trout and all other sensitive fish and aquatic species as noted in the fisheries assessment. Within the project area and haul routes, Ambrose Creek supports westslope cutthroat trout (WSCT); Slocum Creek does not support WSCT.

3.6.4 Existing Watershed Conditions – Sediment Delivery and Water Yield

Section 24 of the Project Area has been dismissed from further analysis. The section 24 parcel includes about 118 acres of state land that is drained by an unnamed tributary of Ambrose Creek in the west half of the parcel. There is no stream or surface water in the proposed harvest unit that is located in the east portion of the parcel, and no connectivity of surface runoff downslope of the harvest unit. The access road to the section 24 parcel crosses two intermittent streams that have inadequate road surface drainage. On the Section 24 parcel there is low potential for offsite runoff downslope due to the small scale of the harvest (81 acres) and the moderate intensity of harvest with retention of about 40% of forest stand. The project area also receives relatively low levels of average annual precipitation (~ 22" average/year) and occurs on well drained soils. Thus it is unlikely the proposed action would cause a measurable change in water yield or increased potential for downslope sediment delivery. The access road will have maintenance completed consistent with BMP's.

The north 1/3 of the Section 30 parcel includes about 160 acres of state land that is drained by an unnamed tributary of Ambrose Creek. This unnamed tributary is an intermittent class 3 stream in the northeast corner of the parcel that is downslope of a proposed harvest unit (about 20 acres of proposed harvest located in this drainage). The stream is well vegetated and stable and no impacts to water quality were noted. There is existing access road on the parcel but it does not cross the class 3 tributary.

The existing access road from the north to section 30 begins at the Ambrose County road and is routed across private forestlands, Bitterroot National Forest and State trust lands. The access road climbs to the northwest corner of the section 30 parcel and crosses into the Slocum Creek/North Fork Burnt Fork Creek drainage and eventually down to a junction with North Fork Burnt Fork road. The upper portions of the road system are gated and have restricted use. Portions of the road are steep and do not have adequate road surface drainage to comply with BMP's. There are two perennial stream crossings of unnamed tributaries to Ambrose Creek on the private access where there is sediment delivery to the streams. Historic effects are increased sediment delivery to stream due to poor road locations, timber harvest and grazing that have affected water quality. Channel stability is fair, due to channel disturbance from grazing animals and sediment principally at the crossing sites.

The south 2/3 of the Section 30 parcel includes about 410 acres of state land that is drained by Slocum Creek, a class 1 stream. The average precipitation/year is moderate at 24-28" and supports moist forest sites on northerly aspects. Soil infiltrations exceed typical rainfall rates and overland flow is rare. There is a high amount of coarse rock in the drainage which has lead to fair to good channel stability in the narrow riparian area adjacent to Slocum Creek that includes two meadows with adjacent wetlands on section 30. The existing access road is poorly located with about 0.38 mile of road within the 50 ft SMZ of Slocum Creek. There is an old native log crossing about 2 feet wide on an existing road in the east ½ of the parcel that has rotted away and failed. Yet the channel is well vegetated with fair stability due in part to the rocky alluvial material at the crossing site. There are several culverts on the access road system that do not comply with BMP's due to a combination of poor installation and inadequate surface drainage and have varied levels of minor to moderate impact on surface water quality.

A road inventory of existing roads on the haul route was completed to identify sediment sources and possible road repairs and mitigations as noted in the water resources section. On the existing access road there are (two) Class 1 stream crossings on unnamed tributary streams in the headwaters of the Ambrose drainage that do not comply with BMP's and require maintenance of road surface drainage. There is sediment delivery from the road surface due to inadequate drainage prior to the crossing sites and deferred maintenance of roads on this segment of private road.

The lower Slocum section 36 has the mainstem of Slocum Creek flowing through the northeast corner of the section. The channel has fair to good stability and intermittent flows that infiltrate and go subsurface in the summer. No actions are proposed within the portion of the section that drains toward the mainstem of Slocum Creek. The south half of section 36 is drained by an intermittent class 3 stream that has ephemeral flow to Slocum for a short duration during spring runoff. The average precipitation/year is low at 18-20" and forest sites are droughty and overland flow is rare. Portions of the access road are higher standard gravel road and some road segments are steep and require maintenance repairs to surface drainage, yet there is low potential for impacts to water quality on these dry sites.

3.7 EXISTING CONDITIONS FISHERIES METHODS AND AREA

Field reviews were conducted on the streams within the Slocum and Ambrose Creek drainages that would be potentially affected by existing and proposed access roads and harvest units. The field reviews involved rapid assessments of potential fisheries resources, including water quality and riparian vegetation within the general project area. The field review did not evaluate the entire watersheds of the hydrology analysis area. Electrofishing was completed by DNRC fish biologist on Slocum Creek for fish presence. Fisheries concerns for the potential effects of sedimentation will be qualitatively addressed for the haul roads and stream crossings on the existing access roads.

3.7.1 Fisheries- Existing Conditions

Slocum Creek is a Class 2 stream that has perennial flow in the south ½ of section 30, but the flow does not deliver to Burnt Fork Creek that is downslope and is unlikely to support fish. The Slocum Creek drainage portion of section 30 and section 36, have intermittent flows on the lower portion of the drainage that are intercepted by two separate irrigation ditches (Rome-Phelps's ditch and the Fillmore-Wood ditch) and there is no return flow to downslope streams. Slocum Creek has fishery habitat variables that could support salmonids and sculpins, however, electrofishing did not find native or non-native fish species present in Slocum Creek at the two stream reaches surveyed. Future fisheries presence in Slocum Creek in the project area is unlikely, due to the extent of downstream disconnected and intermittent streams channels, existing irrigation diversions, multiple barriers at road-stream crossings and potential downstream grazing impacts.

There are no streams in or adjacent to the harvest units of section 24 parcel. Section 30 includes an east west ridge that divides the Slocum and Ambrose drainages. On the north one third of Section 30 draining towards Ambrose Creek, there are no streams on the proposed road locations or within or directly below the proposed harvest units. Ambrose Creek supports westslope cutthroat trout, a sensitive species. Ambrose Creek is not a core or node stream for bull trout. There are no fish presence surveys of the

Ambrose Creek tributary streams that are crossed by the existing access road, but for this analysis, we will consider these unnamed tributaries to Ambrose Creek as supporting fish.

3.7.2 Sediment Delivery

A road inventory of existing roads on the haul route was completed to identify sediment sources and possible road repairs and mitigations as noted in the water resources section. On the existing access road there are (two) Class 1 stream crossings on unnamed tributary streams in the headwaters of the Ambrose drainage that do not comply with BMP's and require maintenance of road surface drainage. There is sediment delivery from the road surface due to inadequate drainage prior to the crossing sites and deferred maintenance of roads on this segment of private road.

Within the Slocum Creek drainage, up to 0.4 miles of relic road is located adjacent to and segments are within the SMZ of Slocum Creek. There is sediment delivery from the road due to the poor road location and one washed out crossing site.

3.8 EXISTING CONDITIONS OF NOXIOUS WEEDS

Noxious weeds present in the project area are knapweed (*Centaurea maculosa*), thistle (*Cirsium arvense*) and houndstongue (*Cynoglossum officinale* L). Knapweed occurs along portions of existing access roads mainly on drier southerly aspects and droughty sites Knapweed, and minor thistle and houndstongue occur in the area (DNRC and adjacent lands). There were not a lot of noxious weeds found within the forested section.

3.8.1 Noxious Weeds Assessment Area and Methods

The area of noxious weed analysis includes the access roads and proposed harvest areas of this project. This analysis will consider the types and location of existing noxious weeds and anticipated effects of the alternatives on noxious weeds.

3.9 EXISTING CONDITIONS OF WILDLIFE

3.9.1 Threatened and Endangered Species

Grizzly Bears

Grizzly bears are native generalist omnivores that use a diversity of habitats found in western Montana. Preferred grizzly bear habitats are meadows, riparian zones, avalanche chutes, subalpine forests, and big game winter ranges, all of which provide seasonal food sources. The search for food drives grizzly bear movements, with bears moving from low elevations in spring to higher elevations through the summer and early fall, as fruits ripen throughout the year. Primary threats to grizzly bears are related to human-bear conflicts, habituation to unnatural foods near high-risk areas, and long-term habitat loss associated with human development (Mace and Waller 1997). Forest-management activities may affect grizzly bears by altering cover and/or by increasing human access into secure areas by creating roads (Mace et al. 1997). These actions could lead to the displacement of grizzly bears from preferred areas and/or result in an increased risk of human-caused mortality by bringing humans and bears closer together and/or making bears more detectable, which can increase the risk of bears being illegally shot. Displacing bears from preferred areas may increase their energetic costs, which may, in turn, lower their ability to survive and/or reproduce successfully.

The project area is approximately 12 miles east of the proposed Bitterroot Ecosystem grizzly bear recovery area, approximately 33 miles south of the Rattlesnake subunit of the NCDE Recovery Area (USFWS 1993), and 36 miles southwest of occupied grizzly bear habitat (Wittinger et al. 2002). However, grizzly bears are increasingly being documented south of the recovery zone (J. Jonkel, MT FWP, personal communication, 2011); additionally, a grizzly bear was observed along Rock Creek and in the Burnt Fork drainage near Stevensville in late 2002, but that bear apparently moved 40 miles towards

Phillipsburg. Grizzly bear density is low and sightings are uncommon. Grizzly bears generally use different habitats relative to season. The project area contains marginally suitable habitats, and would primarily provide low-mid elevation forested areas that would be used during the spring and early summer, but also includes riparian areas and big game winter range. The cumulative effects analysis area is approximately 35,992 acres and includes the area between Rock Creek to the east and the forested-grassland interface on the west, and between Wheelbarrow Creek/Cinnabar Saddle/Cinnamon Bear Creek on the north down to Alder Creek/Lavina Creek/Sawmill Saddle/Sawmill Creek in the south.

Managing human access is a major factor in management for grizzly bear habitat. There are no roads open to the general public in the project area, but legal and illegal access from adjacent lands likely contributes to reduced habitat quality in the project area. Open road densities are moderately high in the cumulative effects analysis area (1.3 mi. /sq/ mi., simple linear calculation). No grizzly bear security habitats exist (≥ 0.3 miles from roads receiving motorized use and $\geq 2,500$ acres in size) in the project area, but 1 block of grizzly bear security habitats (15,413 acres) exist in the cumulative effects analysis area. Hiding cover exists in the forested portions of the project area; recent timber management and wildfires in the cumulative effects analysis area has reduced grizzly bear hiding cover in the cumulative effects analysis area. The USFS Haacke-Claremont Project is altering forested stands; alterations to forested habitats and/or increases in motorized access could occur with the proposed USFS Three Saddles project, which is partially in the cumulative effects analysis area. Across the cumulative effects analysis area, the reductions in hiding cover, the elevated levels of human disturbance, and the mosaic of available habitats likely limits the overall usefulness of portions of the cumulative effects analysis area for grizzly bears.

Canada Lynx

Canada lynx are associated with subalpine forests, generally between 4,000 to 7,000 feet in elevation in western Montana (Ruediger et al. 2000). The proposed project area ranges from approximately 4,520 to 6,080 feet in elevation and is dominated by Douglas-fir, ponderosa pine, and non-forested stands. Lynx habitat in western Montana consists primarily of stands that provide habitat for snowshoe hares, either dense, young coniferous stands or dense, mature forested stands. Lynx in western Montana preferred mature, multi-storied stands with dense horizontal cover year-round; during the summer lynx also selected earlier successional stands with a high horizontal cover (Squires et al. 2010). For denning sites, the primary component appears to be abundant large woody debris, particularly in the form of downed logs, root wads, slash piles, and live trees (Squires et al. 2008). These conditions are found in a variety of climax vegetation habitat types, particularly within the subalpine fir series (Pfister et al. 1977). Historically, high intensity, stand-replacing fires of long fire intervals (150 to 300 years) occurred in continuous dense forests of lodgepole pine, subalpine fir, and Engelmann spruce. These fires created extensive even-aged patches of regenerating forest intermixed with old stands that maintained a mosaic of snowshoe hare and lynx habitat.

Approximately 256 acres of lynx habitat occur in the project area, which was comprised of winter foraging (147 acres) and other suitable lynx habitats (largely forested lands that provide cover to facilitate movement; 109 acres). Connectivity of forested habitats in the project area is only partially intact due to the habitat types present. The cumulative effects analysis area is approximately 35,992 acres and includes the area between Rock Creek to the east and the forested-grassland interface on the west, and between Wheelbarrow Creek/Cinnabar Saddle/Cinnamon Bear Creek on the north down to Alder Creek/Lavina Creek/Sawmill Saddle/Sawmill Creek in the south. DNRC manages approximately 2% (829 acres) of the cumulative effects analysis area; the only DNRC managed lands in the cumulative effects analysis area are within the project area. There are roughly 20,443 acres of forested stands dominated by lodgepole pine and Douglas-fir with $\geq 40\%$ canopy closure of ≥ 5 inch trees across the cumulative effects analysis area; the majority of those stands would likely be suitable lynx habitats and probably include considerable winter foraging habitats. Additionally summer foraging habitats likely exists on a portion of the 15,020 acres of shrubs, herbaceous, and poorly stocked forested stands in the cumulative effects analysis area. The USFS Haacke-Claremont Project is altering forested stands, but is not altering lynx habitats in the cumulative effects analysis area; reductions in suitable lynx habitats could occur with the proposed USFS Three Saddles project that is partially in the cumulative effects analysis area.

3.9.2 Sensitive Species

Fisher

Fishers are a mid-sized forest carnivore whose prey includes small mammals such as voles, squirrels, snowshoe hares, and porcupines, as well as birds (Powell and Zielinski 1994). They also take advantage of carrion and seasonally available fruits and berries (Foresman 2001). Fishers use a variety of successional stages, but are disproportionately found in stands with dense canopies (Powell 1982, Johnson 1984, Jones 1991, Heinemeyer and Jones 1994) and avoid openings or young forested stands (Buskirk and Powell 1994). However, some use of openings may occur for short hunting forays or if sufficient overhead cover (shrubs, saplings) is present. Fishers appear to be highly selective of stands that contain resting and denning sites and tend to use areas within 150 feet of water (Jones 1991). Resting and denning sites are found in cavities of live trees and snags, downed logs, brush piles, mistletoe brooms, squirrel and raptor nests, and holes in the ground. Forest-management considerations for fisher involve providing for resting and denning habitats near riparian areas while maintaining travel corridors.

There are approximately 75 acres of potential upland fisher habitats and no riparian habitats in the project area. The cumulative effects analysis area is approximately 35,992 acres and includes the area between Rock Creek to the east and the forested-grassland interface on the west, and between Wheelbarrow Creek/Cinnabar Saddle/Cinnamon Bear Creek on the north down to Alder Creek/Lavina Creek/Sawmill Saddle/Sawmill Creek in the south. DNRC manages approximately 2% (829 acres) of the cumulative effects analysis area; the only DNRC managed lands in the cumulative effects analysis area are within the project area. There are roughly 20,443 acres of forested stands dominated by lodgepole pine and Douglas-fir with $\geq 40\%$ canopy closure of ≥ 5 inch trees across the cumulative effects analysis area; some of those stands would likely be suitable fisher habitats, particularly along the riparian areas associated with the numerous streams that exist in the cumulative effects analysis area. Much of the 15,020 acres of shrubs, herbaceous, and poorly stocked forested stands in the cumulative effects analysis area would not be expected to be suitable fisher habitats for some time, if ever. The USFS Haacke-Claremont Project is altering forested stands in the cumulative effects analysis area; fisher habitats could be further reduced with the proposed USFS Three Saddles Project, which is partially in the cumulative effects analysis area.

Flammulated Owl

Flammulated owls are tiny, migratory, insectivorous forest owls that inhabit old, open stands of warm-dry ponderosa pine and cool-dry Douglas-fir forests in the western United States and are secondary cavity nesters. In general, preferred habitats have open to moderate canopy closure (30-50%) with at least 2 canopy layers, and are often near small clearings. They usually nest in cavities excavated by pileated woodpeckers or northern flickers in 12-25" dbh ponderosa pine, Douglas-fir, or aspen. Without disturbance, Douglas-fir encroach upon ponderosa pine stands resulting in increased stand density and decreased habitat quality for flammulated owls. Periodic, low-intensity underburns can increase habitat suitability and sustainability by reducing the density of understory seedlings and saplings, stimulating shrub growth, and by protecting large dominant trees from ladder fuels and competition with other mature trees.

There are approximately 755 acres of potential flammulated owl habitats in ponderosa pine and dry Douglas-fir stands across the project area. The cumulative effects analysis area encompasses the project area and lands within a one mile radius (approximately 9,227 acres). Suitable flammulated owl habitats likely exist on much of the 5,152 acres of forested, open forest, and recently harvested stands on other ownerships in the cumulative effects analysis area. Those areas that have been harvested in the recent past, potentially improved flammulated owl habitats by creating foraging areas, reversing a portion of the Douglas-fir encroachment, and opening up stands of ponderosa pine. Similarly, ongoing harvesting associated with the USFS Haacke-Claremont Project is altering flammulated owl habitats in the cumulative effects analysis area, and the proposed USFS Three Saddles Project could alter additional flammulated owl habitats in the cumulative effects analysis area.

Gray Wolf

Wolves are a wide-ranging, mobile species that occupy a wide variety of habitats that possess adequate prey and minimal human disturbance, especially at den and/or rendezvous sites. Wolves are opportunistic carnivores that frequently take vulnerable prey (including young individuals, older individuals, and individuals in poor condition). In general, wolf densities are positively correlated to prey densities (Fuller et al. 1992, Oakleaf et al. 2006). In Montana, wolves prey primarily on white-tailed deer and elk (Kunkel et al. 1999, Arjo et al. 2002). Thus, reductions in big game populations and/or winter range productivity could indirectly be detrimental to wolf populations.

Wolves typically den during late April in areas with gentle terrain near a water source (valley bottoms), close to meadows or other openings, and near big game wintering areas. When the pups are 8 to 10 weeks old, wolves leave the den site and start leaving their pups at rendezvous sites while hunting. These sites are used throughout the summer and into the fall. Disturbance at den or rendezvous sites could result in avoidance of these areas by the adults or force the adults to move the pups to a less adequate site. In both situations, the risk of pup mortality increases.

Big game species are abundant in the project area much of the year; winter range exists in the project area for white-tailed deer and elk. Several landscape features commonly associated with denning and rendezvous sites occur in the project area, such as areas with gentle terrain near a water source (valley bottoms), openings, and proximity to big game wintering areas. Wolves have been documented in the project area; the project area has been in the Welcome Creek wolf pack annual home range for at least the last 4 years. This pack has produced an average of 3 pups during that period and was counted as one of the breeding packs in Montana in 2010 (USFWS et al. 2011). No known den or rendezvous sites for this pack occurs in the project area, but the possibility of den or rendezvous sites occurring in the project area exists. Wolves are likely using the vicinity of the project area for hunting, breeding, and other life requirements.

Within the larger, cumulative-effects analysis area, big game species are fairly abundant; big game winter range exists in the cumulative effects analysis area, but mostly only at the lower elevations on the eastern and western edges. Numerous landscape features commonly associated with denning and rendezvous sites, including meadows and other openings near water and in gentle terrain, occur in the cumulative-effects analysis area. Past harvesting and human developments have altered big game and wolf habitats in the cumulative effects analysis area. Alterations in wolf and big game habitats are occurring with USFS Haacke-Claremont Project in the cumulative effects analysis area; further changes in wolf and big game habitats could occur with the proposed USFS Three Saddles Project that is partially in the cumulative effects analysis area.

Pileated Woodpeckers

Pileated woodpeckers are one of the largest woodpeckers in North America and excavate the largest cavities of any woodpecker. Preferred nest trees are large diameter western larch, ponderosa pine, cottonwood, and quaking aspen trees and snags, usually 20 inches dbh and larger. Pileated woodpeckers primarily eat carpenter ants, which inhabit large downed logs, stumps, and snags. Aney and McClelland (1985) described pileated nesting habitat as "...stands of 50 to 100 contiguous acres, generally below 5,000 feet in elevation with basal areas of 100 to 125 square feet per acre and a relatively closed canopy." The feeding and nesting habitat requirements, including large snags or decayed trees for nesting and downed wood for feeding, closely tie these woodpeckers to mature forests with late-successional characteristics. The density of pileated woodpeckers is positively correlated with the amount of dead and/or dying wood in stands (McClelland 1979).

In the project area, potential pileated woodpecker nesting habitat exists on approximately 114 acres. These nesting habitats are dominated by Douglas-fir and western larch types. Additionally, 840 acres of sawtimber stands dominated by Douglas-fir and ponderosa pine exist in the project area, which are potential foraging habitats. Pileated woodpeckers have been seen and/or heard in the project area during several field visits and may be nesting on the parcel. The cumulative effects analysis area encompasses the project area and lands within a one mile radius. The only DNRC-managed parcels in the cumulative effects analysis area are found in the project area; potential pileated woodpecker nesting and foraging

habitats likely exist on much of the 1,862 acres of forested habitats on other ownerships in the cumulative effects analysis area. Much of the 3,290 acres of open forest, young forest, and recently harvested stands on other ownerships in the cumulative effects analysis area is likely to open to be useful to pileated woodpeckers. Pileated woodpecker habitats are being reduced with the USFS Haacke-C Claremont Project in the cumulative effects analysis area. Further reductions in pileated woodpecker habitats could occur with the proposed USFS Three Saddles Project that is partially in the cumulative effects analysis area; however proposed treatments in the cumulative effects analysis area would likely only reduce habitat quality and continued use of the proposed units would be likely.

3.9.3 Big Game Winter Range

Winter ranges enable big game survival by minimizing the effects of severe winter weather conditions. Winter ranges tend to be relatively small areas that support large numbers of big game, which are widely distributed during the remainder of the year. These winter ranges have adequate mid-story and over story to reduce wind velocity and intercept snow. The effect is that temperatures are moderated and snow depths are lowered, which enables big game movement and access to forage with less energy expenditure than in areas with deeper snow and colder temperatures. Snow depths differentially affect big game; white-tailed deer are most affected, followed by mule deer, elk, and then moose. Thus, removing cover that is important for wintering big game through forest management activities can increase their energy expenditures and stress in winter, but may increase forage production for use on summer range. Reductions in cover could ultimately result in a reduction in winter range carrying capacity and subsequent increases in winter mortality within local big game herds.

Montana Department of Fish, Wildlife, and Parks identified white-tailed deer (609 acres) and elk (1,320 acres) winter range in the project area. These winter ranges are part of larger winter ranges in the area. Mature Douglas-fir, ponderosa pine, and mixed conifer stands in the project area are providing attributes facilitating use by wintering big game. Approximately 804 acres of the project area appear to be providing snow intercept and thermal cover attributes. Evidence of non-winter use by deer and elk was noted throughout the project area during field visits.

A variety of stands across the 648,732-acre winter range, used for the cumulative effects analysis area, is presently providing thermal cover and snow intercept for big game. In the recent past, harvesting within this area has reduced thermal cover and snow intercept; ongoing harvesting across the winter range could continue altering these attributes while potentially disturbing wintering big game. Portions of the cumulative effects analysis area have been converted to agriculture and other human developments and would not be expected to provide thermal cover or snow intercept in the future. Human disturbance within the winter range is associated with residential development, agricultural clearing, recreational snowmobile use, commercial timber management, and the numerous highways and secondary roads. Reductions in thermal cover are ongoing with the USFS Haacke-C Claremont Project in the cumulative effects analysis area; further reductions in thermal cover could occur with the proposed USFS Three Saddles Project that is partially in the cumulative effects analysis area.

3.9.4 Elk Security Habitat

Timber harvesting can increase elk vulnerability by changing the size, structure, juxtaposition, and accessibility of areas that provide security during hunting season (Hillis et al. 1991). As visibility and accessibility increase within forested landscapes, elk and deer have a greater probability of being observed and, subsequently, harvested by hunters.

Areas that are within 0.5 mile of an open road do not provide elk security habitat. Approximately 591 acres in the project area are part of a 1,242-acre patch of area that is more than 0.5 miles from open roads in the cumulative-effects analysis area. Additionally, hiding cover, which is the other component of elk security habitat, is abundant in the portions of the project area contributing to elk security habitats. While there are no open roads within the project area, some access from adjacent lands (both legal and illegal) likely reduces the effectiveness of this block of security habitat for elk; several elk were harvested from this block during the general hunting season in 2011. Within the cumulative effects analysis area, hiding cover is fairly abundant with a combination of dense stands of over story trees and conifer regeneration. In the cumulative effects analysis area there are 3 blocks (totaling at least 13,006 acres;

36.2% of the cumulative effects analysis area) that are more than 0.5 mile from open roads, contain abundant hiding cover, and are sufficiently large to provide elk security habitats, which exceeds the 30-percent minimum threshold established by Hillis et al. (1991). Much of this habitat exists on the eastern side of the divide in the Rock Creek drainage. Low levels of hunter access exist in the project area; restricted roads appear to facilitate some motorized and non-motorized access. Human access is fairly good within the 35,992-acre cumulative effects analysis area with at least 72 miles of open roads (1.3 miles/square mile) that facilitate access and at least 135 miles of restricted roads (2.4 miles/square mile) that allow non-motorized access. However, human access varies across the cumulative effects analysis area, with rather remote areas that are fairly difficult to access and areas with considerable open and closed roads that are more accessible, which alters the effectiveness of the landscape for providing secure areas for big game species. Some reductions in the hiding cover component of elk security habitat are occurring with the USFS Haacke-Claremont Project in the cumulative effects analysis area, but no changes to hiding cover within identified blocks of elk security habitat are occurring. Similarly, slight reductions in hiding cover could occur with the proposed USFS Three Saddles Project that is partially in the cumulative effects analysis area, but no changes to hiding cover in any of the identified blocks of security habitats or changes in motorized access that would alter elk security habitats would occur.

3.10 EXISTING CONDITIONS OF AESTHETICS

It is primarily the west facing aspects on the section that can be seen from private ownerships or heavy use areas. These areas are primarily homes west of the project area located within the Bitterroot Valley and along the Hwy93 corridor. Although the Slocum Creek Section 30 can be seen from the valley east of Stevensville, it is such a distance away that it is a small spot on the landscape.

From the stand level (on the site), most of the section is completely timbered with very few high standard roads, which can be aesthetically pleasing to many. There has been little to no effect aesthetically from road construction in the analysis area as they are not visible from the valley bottom. At the stand level, sight distances are shorter due to increased stocking levels and there has been an increase in physical deformity in most of the Douglas-fir from mistletoe, both from the exclusion of fire over time. Some of the higher standard roads that are maintained are quite evident on the site while many of the older roads that are not maintained are revegetating and becoming less evident.

CHAPTER 4: ENVIRONMENTAL EFFECTS

4.0 INTRODUCTION

Chapter 4 describes the environmental effects of each alternative on the resources described in Chapter 3. Cumulative effects from current management and foreseeable future State actions are discussed in this chapter. These include other active timber sales, those in the planning stage, ongoing maintenance, and other uses of the areas being analyzed. Direct, indirect and cumulative effects on the resources being analyzed were considered. Chapter 2 described the details of each alternative and listed the proposed mitigation measures specific to the action alternative.

4.1 PREDICTED EFFECTS ON ROADS

No Action - Direct, Indirect, and Cumulative Effects to Roads

The No Action Alternative would cause no direct, indirect, or cumulative effects to road use.

Action Alternative - Direct, Indirect, and Cumulative Effects to Roads

All existing roads would be repaired and maintained to meet BMP standards. All new roads would be constructed to meet BMP's and promptly re-vegetated after project completion. Approximately .4 miles of existing road adjacent to Slocum Creek would be abandoned and approximately .69 miles of new road would be relocated away from Slocum Creek. All of these roads will be closed for motorized use to the general public.

4.2 PREDICTED EFFECTS ON VEGETATION

4.2.1 Stand Health

Direct, Indirect, and Cumulative Effects to Stand Health on the No-Action Alternative A

Under this alternative, stand health would continue to decline as mistletoe continues to worsen in the Douglas-fir. Increased tree mortality from mistletoe would be expected as the disease spreads and worsens causing increased physical deformity and decay. Understory trees would continue to become infected and not be recruited into the over story, due to the growth inhibiting effects of the mistletoe with the result being very little over story cover and very little chance for new growth to reach the over story. Increased stand densities would result in a continued decline in stand vigor and growth and increased susceptibility to insects, disease, and/or fire. If the mountain pine beetle (MPB) is left unchecked it will continue to cause mortality in the Ponderosa pine across all age classes especially as stand densities increase above the currently overstocked levels.

Direct, Indirect, and Cumulative Effects to Stand Health on the Action Alternative B

Under this alternative, 234 acres of less vigorous trees and those infected by MPB and Dwarf Mistletoe would be removed. A restoration harvest would occur on approximately 119 acres to reduce the potential of MPB attacks on the older Ponderosa pine and a Sanitation/Salvage harvest would occur on 97 acres to remove dead and dying trees. Reducing stand densities would result in improved stand vigor and reduced susceptibility to future insect attacks and growth inhibiting diseases such as dwarf mistletoes. Under this alternative understory trees would not become infected and would be recruited into the over story over time and the older Ponderosa pine should become less susceptible to future MPB attacks. Harvesting activities conducted under the action alternative are expected to maintain current cover types on all but 16 acres that would be converted from a current cover type of Douglas-fir to the desired cover type of ponderosa pine.. Favoring Ponderosa pine will create a more historic species representation that should better provide habitat for native plant and animal species that evolved with these forest types.

4.2.2 Fire Hazard

All of the proposed treatments are designed to emulate the effects of fire or bring the stands back toward a state that would have been expected had fires not been excluded from these ecosystems.

Direct, Indirect, and Cumulative Effects of the No-Action Alternative A on Fire Hazard

Under this alternative, no treatments would occur and therefore the stands would continue to increase in densities and abundance and coverage of mistletoe. The stands would remain at high fuel loadings and

ladder fuels would continue to increase at levels well above those expected without the exclusion of fire. There would continue to be a high risk of a high intensity, stand replacing fire occurring across either of the parcels and therefore the fire hazard would remain high. This condition would be expected to increase over time until the fuels are modified by an ecological disturbance or by management activities.

Direct, Indirect, and Cumulative Effects of the Action Alternative B on Fire Hazard

Under the Action Alternative treatments would thin the stands thereby reducing canopy coverage and the chance of a crown fire. They would also reduce ladder fuels by removing and thinning smaller trees, which would reduce the chance of fire reaching and carrying in the crowns of the stands. It would reduce standing fuel loadings by removing forest products from the site. All of these factors would contribute to smaller more controllable and lower intensity fires that would more closely resemble those that might have been expected to occur naturally before the exclusion of fire.

A majority of the tops, limbs, and unusable pieces of the trees would be left out in the forest to recycle nutrients to the soils and to provide coarse woody debris for microorganisms and small mammals as well as their benefits to the residual stand. This slash would increase fire hazard on the site for up to 2 years as it cures and decomposes. Any slash left in the harvest units would meet the State Hazard Reduction Law. So the effects of reducing standing fuels, canopies, and ladder fuels may be offset for the first two years by the effects of increased ground fuels from slash. There would also be slash piles at the landings, which would be burned within 18 months of their creation.

4.3 PREDICTED EFFECTS ON SOIL RESOURCES

Effects of No-Action Alternative A on Soils

The No-action alternative would have no change in direct, indirect or cumulative effects on soil resources over the existing conditions. No harvest or thinning would occur. Overstocked stands may be subject to higher burn effects if a wildfire occurred.

Effects of Action Alternative B on Soils:

The primary risks of timber harvest impacts to soils are displacement, erosion, and compaction of surface soils from equipment operation and road construction and the combined effects are summarized in table S-2. Skid trail planning would be used to control the area of surface soils that can be displaced, compacted or subject to erosion. Erosion is more of a concern where soils on steeper slopes are disturbed and surface litter is removed. Emphasis is to use existing landings and skid trails as feasible to reduce area affected and improves skidding efficiency. Light disturbance of the surface duff is expected with skidding operations and has minor effects on soils and the surface quickly recovers with needle litter and vegetation. Light disturbance is a silvicultural goal to promote tree regeneration, especially in areas supporting western larch. Ground based skidding equipment will be limited to slopes less than 45% unless on existing approved trails and projected maximum soil impacts would be up to 15% of harvest units, and likely lower based on previous monitoring (DNRC 2005). A cable system (skyline) would be used for steeper slopes over 45% in parts of Section 30 (Unit 30-2, Unit 30-3) and Unit 1A in Section 36 to avoid excessive soil disturbance and projected maximum soil impacts would be up to 15% of harvest units. Season of use will be limited to adequately dry, frozen or snow covered conditions to reduce soil disturbance and compaction. Skid trails will be stabilized by installing surface drainage where needed or slashing skid trails to control erosion.

Table S-1 Harvest Effects on Soils from Proposed Action			
Harvest Areas	Acres	Operation	Estimated max. acres impacted *
Section 24	39ac Tree select/Sal	Tractor 39 ac	5.8
Section 30 Unit 1	55ac. San/Salvage	Tractor 55 ac	8.2
Section 30 Unit 2	94ac Minor RMZ	Tractor 10 ac	1.5
		Cable 85 ac	4.3
Section 30 Unit 3	119ac Restore	Tractor 119 ac	17.8
Section 30 Unit 4	42ac Tree select/Sal	Tractor 42 ac	6.3
Section 36	101ac Tree select/Sal	Tractor 97 ac	15
		Cable 4ac	0.2
Section 30 Roads	2.8ac New Road		
	1.6ac. Abandon		
Totals	Roads 1.2 acres net	Harvest Ac. 450	60.3 ac. (13.3.% of total)

Harvest operations and slash disposal will limit the amount of surface disturbance to the minimum required for silvicultural goals and retain a proportion of organic fine litter and 5-15 tons/ acres woody debris. Maintaining the litter layer by limiting displacement and retaining organic fine litter and woody debris which helps prevent erosion and aids moisture retention, and supports root mycorrhizae and for nutrient cycling. Mycorrhizae fungus colonizes the host plant's roots and extends the root systems ability to uptake moisture and soil nutrients.

The proposed access would use existing roads with spur road construction of 0.69 miles (2.8 ac.) on gentle terrain, and partly on an old road location. A poorly located segment of road 0.4 mi. in length (1.6 ac.) that is adjacent to Slocum Creek would be abandoned and stabilized. The combination of 0.69 miles of new road minus 0.4 mi. abandoned and stabilized would result in 0.29 mi. net new road. Roads are generally in good condition, yet require maintenance grading, especially on road segments with steeper grades. Surface erosion can be controlled with standard road surface drainage, implementation of BMP's and reseeded disturbed roadsides and landings. Portions of the main haul route to the north, cross clayey soils that are subject to rutting if operated on when wet. The main access road to Burnt Fork is graveled across the road segments prone to rutting.

4.3.1 Cumulative effects of Action Alternative B to soils

Cumulative effects to soils could occur from additive impacts of repeated entries into the harvest area. The risk of cumulative effects are low to moderate based on limiting harvest effects of soil compaction and displacement to 15% of the area, by using the existing skid trails, landings and skid trail planning, limiting operations on steep slopes and use of existing roads. This will be accomplished by timber sale administration to monitor conditions during operations. Alternative B would construct 0.69 miles of new road and abandon 0.4 mi. of poor existing road. Considering nutrient cycling, the high level of tree mortality has already caused many needles and fine litter to fall to the forest floor. Most needles and fine foliage that have not already fallen would be expected to break off during logging operations. Large woody debris would be maintained on the site with a goal of 5-15 tons/acre (Graham 1994). Coarse wood will be well distributed throughout the units and trampled to help promote decay processes, maintain nutrient cycling for long term soil productivity and to encourage micro growing sites for reforestation. Improved tree spacing will reduce competition for nutrients and soil moisture, enhance growth of retained trees, and promote regeneration of conifers. The action alternatives presents a low risk of additive cumulative effects to soils based on minimal previous harvests in the proposed harvest units and implementation of skidding and slash disposal mitigation measures to limit the area impacted.

4.4 PREDICTED EFFECTS ON WATER RESOURCES

4.4.1 Effects of No-action Alternative A on Water Resources

No change in direct, indirect or cumulative effects to water quality or quantity (water yield) would be expected to result other than those described under existing water resources conditions. Sedimentation on existing access roads with inadequate surface drainage (mainly at culverts) would continue to impact water quality unless mitigations or remedial actions are taken.

4.4.2 Effects of the Action Alternative B on Water Resources

The proposed project would harvest approximately 2.1 mmbf of timber from up to 450 acres that includes sanitation/salvage harvest on 97 acres, dispersed across 3 project sections that are located in 2 primary drainages as noted in table WS-2. The proposed action is mainly moderate harvest of trees that are overstocked, dead or in poor condition.

Table WS -2 Proposed Actions on Harvest Units and Roads						
Section/Acres	Harvest Acres & Method	Volume	Existing Roads	Recon Roads	New Roads	Reclaim Roads
24,T9N,R19W	39Tractor Individual Tree select	142 mbf	.72	----	----	----
30,T9N,R18W	55,94,119,42=310 Tractor & Cable San/Salvage/individual tree selection	1498 mbf	4.3 mi.	1.3 mi.	B 0.69 mi.	0.40 mi.
36,T9N,R19W	101 Tractor & Cable Individual tree selection	506 mbf	2.8 mi	----	----	----
ALT B Total	450 ac	2.14 mmbf	7.82	1.3 mi.	0.69 mi.	0.40

The SMZ width for all sites along Slocum Creek is mainly 50ft based on the shallow slopes, with some short reaches of 100 ft SMZ where short steep slopes exceed 35% adjacent to Slocum Creek. No SMZ harvest occurs with the first 50 feet parallel to Slocum Creek, except for minor tree removal at the crossing site in Section 30. An RMZ was established as a 93 foot strip adjacent to Slocum Creek in section 30 (Stand potential tree height) that includes the 50 to 100 ft SMZ based on slope gradient. RMZ selective harvest may occur on a strip from 50 to 93 feet that parallels Slocum Creek and harvest may occur on up to 8 acres within the RMZ. The RMZ harvest prescription would retain 40 % or more of standing trees and snag recruitable trees for stream large woody debris. Protective measures for the Riparian Management Zone (RMZ) will be implemented to comply with all forest management rules to minimize effects.

Action Alternatives B would use existing haul roads and road drainage would be improved to comply with BMP's. The Ambrose Creek road would be used as the haul route for harvest operations in section 24 and the north ½ of section 30. Harvest operations for section 36 and the south ½ of Section 30 would likely use a winter haul route to the south to access the Burnt Fork Road. Several stream crossings on the Ambrose haul road would have substantial reductions in sediments from road surfaces concurrent with use and improve water quality. One failed log crossing on Slocum Creek would be replaced with a larger culvert on the east ½ of Slocum Creek, and a short culvert would be replaced. A short term increase in sediment delivery is expected during construction, but is expected to be minor and subside quickly. The long term effects are a reduced potential for sediment delivery and improved water quality. Alternative B would construct 0.69 mi. of new road. All new road construction proposed for Alternative B is located on moderate grades and would not construct additional stream crossings.

In summary the proposed logging operations and road construction are expected to have low risk of direct and indirect impacts to water quality and will reduce sedimentation based on implementing BMP's, and Forest Management Rules.

4.4.3 Cumulative Effects of No-Action Alternative to Water Quality and Quantity (water yield)

There would be no change in cumulative effects to water quality and water yield from existing conditions. Continued insect mortality or wildfire may increase runoff and water yield relative to increasing canopy loss.

4.4.4 Cumulative Effects of Action Alternative to Water Quality and Quantity (water yield)

The proposed project would result in beneficial cumulative effects and low risk for additional cumulative effects to water quality from the implementation of this alternative, compared to the no-action alternative based on the following. The project within the Slocum Creek drainage would not harvest within 50 feet of the stream that would maintain a buffer to trap sediment. Segments of road within the SMZ of Slocum Creek that are current sediment sources would be relocated to reduce sedimentation and improve long term access. Minor harvest would occur within the RMZ that is 93 ft adjacent to Slocum Creek implementing protective measures and mitigations to control erosion. One washed out crossing site would be replaced with a larger culvert that matches the streams bankfull width. The new road segments proposed are located on dry, stable locations with low potential for off-site sedimentation and no new stream crossings are proposed. Road drainage on the existing private and DNRC access roads would be improved concurrent with DNRC use. A short term increase in sediment delivery is expected during crossing replacement and maintenance, but is expected to be minor and subside quickly. The long term result would be reduced sediment delivery at several stream crossings and the cumulative effects should be beneficial to improve water quality.

The proposed harvest within the Ambrose Creek drainage that includes the section 24 parcel and north 1/3 of section 30 would be 157 acres within two tributaries, and represents a small portion (1.2%) of this 13,251 acre watershed. The harvest areas have low to moderate average annual precipitation of 20 to 26 year, well drained soils with infiltration rates of that mainly exceed 6"/hour and no streams within the proposed harvest units. There is low potential for surface runoff or measurable water yield increases from the proposed partial harvest and low risk of direct, in-direct or cumulative effects compared to no-action.

The proposed harvest within the Slocum Creek drainage would be approximately 183 acres in upper Slocum section 30, and 88 acres in section 36 a tributary of lower Slocum drainage. The combined harvest of 271 acres represents 1.3% of the Burnt Fork-Bitterroot River Watershed drainage. Section 36 is approximately 60 % forested on mainly the northerly aspects with mixed grasslands and sage on the south and westerly slopes. Section 36 has a relatively dry 19 to 21 inch average annual precipitation. The combination of moderate harvest levels that include salvage, low to moderate average annual precipitation, and intermittent flow presents low potential for surface runoff or measurable water yield increases from the proposed partial harvest. Based on these factors there is low potential for impacts to stream channel form or function and low risk of cumulative effects compared to no-action

4.5 PREDICTED EFFECTS ON FISHERIES RESOURCES

4.5.1 Project Area Dismissed from Further Fisheries Analysis

The proposed harvest areas within the Ambrose Creek and Slocum Creek drainage parcels will be dismissed from fisheries analysis based on the following: there are no streams on the DNRC project area in the harvest units of section 24, or section 30 that support fish. On the north one third of Section 30 draining towards Ambrose Creek, there are no streams on the proposed road locations or within or directly below the harvest units, and there would be no affect to fisheries.

4.5.2 Effects of the No-Action Alternative on Fish Habitat-Sediment Delivery

With no action, no road construction or planned timber harvest would occur and road maintenance would be limited and sediments from roads would continue to affect Ambrose Creek and tributaries, until deferred road maintenance is completed to comply with BMP's. Slocum Creek drainage is unlikely to support fish.

4.5.3 Effects of the Action Alternative on Fish Habitat-Sediment Delivery

The proposed ground based timber harvest and use of existing roads is expected to result in overall low risk of erosion and sediment delivery to streams as disclosed in the water resources section. No riparian harvest is proposed in the Ambrose Creek drainage. The new road segments proposed are located on dry, stable locations with low potential for off-site sedimentation and no new stream crossings are proposed across fishery streams. Road drainage on the existing private and DNRC access roads would be improved concurrent with DNRC use. Sediment delivery at several existing crossings of tributaries to Ambrose Creek would be reduced by road drainage repairs and maintenance and water quality is expected to improve. Within the Ambrose Creek drainage there is low risk of direct, indirect or cumulative effects to fisheries-related resources from the proposed actions based on, no harvest near streams, and implementation of BMP's and drainage improvements that would be expected to improve water quality.

While it is unlikely that fish occur in Slocum Creek, the proposed road relocation to stabilize and abandon a .4 mile segment of road would improve water quality. There would be a minor and short term effect to sediment during the replacement of the washed out crossing site that should quickly stabilize as noted in the water resources section. Based on implementation of the BMP's, mitigations and drainage improvements the proposed actions would not be expected to have more than a very low risk of direct, indirect or cumulative effects to fisheries-related resources in the Slocum Creek drainage.

4.6 PREDICTED EFFECTS ON NOXIOUS WEEDS

4.6.1 Effects of No-Action Alternative on Noxious Weeds

Under the no-action alternative, noxious weeds will continue to spread along open roads and onto dry habitat. There is minor traffic on the gated roads and animals and wind will continue to carry seeds through the area. The competitive nature of native vegetation has limited weed spread. DNRC would treat roadside edges and provide bio-control as funding is available. The grazing licensee would be required to implement weed control measures consistent with the lease agreement, which should provide long term weed control.

4.6.2 Effects of Action Alternative on Noxious Weeds

The action alternative will involve ground disturbing activities that have the potential to introduce or spread noxious weeds in susceptible habitat types, and animals and wind will carry seeds through the area. For the action alternative, a combination of integrated weed management measures including prevention, revegetation, biocontrol and herbicide application on spot outbreaks are considered the most effective weed management treatments. Where noxious weeds are currently limited to portions of existing roads, mainly on road edges, DNRC would use herbicide treatments for effective control on a site specific basis to reduce existing weeds. Even with these efforts we expect noxious weeds may increase where adjacent lands are not treated. Larger infestations are good candidates for biocontrol.

There is a moderate risk of stable or increased weeds with the proposed action and the combination of mitigations should hold weeds near current conditions and efforts will be made to reduce current infestations. Mitigations include limiting disturbance to the targets needed for silvicultural goals, requiring clean equipment, grass seeding roads, treating roads and infestations with herbicides. DNRC will monitor the sites for 2 years to evaluate weed control measures implemented and determine if any new noxious weeds establish that were not previously identified.

4.6.3 Noxious Weeds-Cumulative Impacts of No-Action

Impacts of noxious weeds within the project areas are moderate. Weeds have spread through the drainage across ownerships over time and are prone to more dispersal along open roads. Weeds also have spread by multiple uses from wind, traffic, forest management and wildlife. Current weed infestations are mainly limited to roadsides within the project parcel and open forest sites. As tree density and vegetation increase, weeds are reduced through vegetative competition.

4.6.4 Noxious Weeds - Cumulative Impacts of the Action Alternative

Impacts of noxious weeds within the project areas are moderate. Weeds have spread through the drainage across ownerships over time mainly along roadsides and open forest sites with multiple uses and by seed dispersal from wind, traffic and wildlife. Timber harvest throughout these drainages has increased grass growth and the risk for noxious weeds to spread through ground disturbance. Within the project area, overall cumulative effects of increased noxious weeds to weed are expected to be low to moderate, based on herbicide treatments of existing weeds along roads and implementing prevention measures to reduce new weeds, by cleaning equipment and planting grass on roads to compete against weeds.

4.7 PREDICTED EFFECTS ON WILDLIFE

Grizzly Bear

Direct and Indirect Effects of the No-Action Alternative to Grizzly Bears

No direct or indirect effects to grizzly bears would be anticipated since: 1) no disturbance or displacement would be expected, 2) no appreciable changes in hiding cover would occur, 3) security habitat would not be altered, and 4) no changes in long-term open-road densities would be anticipated.

Cumulative Effects of the No-Action Alternative to Grizzly Bears

No appreciable changes to existing habitats would be anticipated; advances in succession within those recently harvested and burned stands could improve hiding cover and potentially foraging habitats for grizzly bears. Use of the cumulative effects analysis area by grizzly bears would not be expected to change from present levels. Thus, no further adverse cumulative effects to grizzly bears would be anticipated since: 1) no changes in human disturbance levels would be expected; 2) no changes to open road density would occur; 3) no further modifications to hiding cover would occur; and 4) no changes to security habitats would be expected.

Direct and Indirect Effects of the Action Alternative to Grizzly Bears

This alternative might affect grizzly bears directly through increased road traffic, noise, and human activity, and indirectly by altering the amount of hiding cover and forage resources. Activities in grizzly bear habitats reduce grizzly bear security, possibly resulting in increased stress and/or energy expenditure to endure the disturbance or to move from the area. These disturbances would only be present during harvesting operations; therefore, the season of disturbance is important in addressing effects to grizzly bears. Roughly 190 acres (43%) would occur during the denning period, which would likely have no direct effects to grizzly bears. Some disturbance of grizzly bears would be possible with any activities that may occur during the non-denning period. Use of the project area by grizzly bears would likely be the greatest during the spring and early summer; efforts to avoid harvesting during the spring period (April 1 –June 15) would further reduce the likelihood of disturbing and displacing grizzly bears. Overall, the proposed activities would occur in areas where low levels of grizzly bear use would be anticipated or would occur during the time periods when grizzly bears would not be expected to be using the area, leading to negligible disturbance and displacement of grizzly bears.

Hiding cover, defined as vegetation that will hide 90 percent of a grizzly bear at a distance of 200 feet, would be reduced on roughly 163 acres and the quality of hiding cover on an additional 275 acres would be reduced in the short-term. Some hiding cover in the form of brush, shrubs, and sub-merchantable trees would persist in several of the units, albeit at a reduced level from the existing condition; hiding

cover would increase through time as young trees and shrubs regenerate over the next 5 to 10 years. Security habitat would not be entered or altered with this alternative.

Up to 0.69 miles of new, restricted roads would be constructed with the proposed activities. No changes in open road density or motorized public access would be anticipated. Some increases in non-motorized human access could occur on the newly constructed roads; roughly 0.38 miles of restricted road would be reclaimed, which would partially offset this increase in non-motorized access. Thus, a minor risk of adverse direct or indirect effects to grizzly bears would be anticipated since: 1) a low potential for disturbance and displacement would be anticipated; 2) hiding cover would be reduced in a portion of the project area, but would remain in portions of the project area, and would be expected to recover in the short-term; 3) no changes to security habitats would be expected; and 4) no changes to long-term open road density would be anticipated.

Cumulative Effects of the Action Alternative to Grizzly Bears

The proposed project could temporarily increase human disturbance to grizzly bears within a portion of the cumulative effects analysis area for any activities that may be conducted during the non-denning period. Proposed activities would occur on the edge of the cumulative effects analysis area, in an area already experiencing some human disturbance, and away from the more remote portions of the cumulative effects analysis area that are more likely to be used by grizzly bears. Furthermore, seasonal restrictions on portions of the proposed activities would limit harvesting to the denning period, which wouldn't disturb or displace grizzly bears. Collectively, minor short-term (2-4 years) increases in human disturbance would be anticipated in a portion of the cumulative effects analysis area, but again would largely occur during the periods when bears would not be using the area or would occur during the denning period. Continued use of the cumulative effects analysis area by grizzly bears would be anticipated at levels similar to present levels. Reductions in hiding cover would be additive to the reductions from past timber harvesting, recent wildfires, ongoing harvesting, proposed harvesting, as well as more permanent land-cover changes in the cumulative effects analysis area; however, appreciable amounts of the cumulative effects analysis area are currently providing hiding cover. Early successional stages of vegetation occurring in harvest units could provide foraging opportunities that do not exist in some mature stands. No changes in long-term open-road density would be anticipated; a slight increase in non-motorized access to a small portion of the cumulative effects analysis area would occur. Thus, a minor risk of adverse cumulative effects to grizzly bears would be anticipated since: 1) minor increases in human disturbance levels in the short-term would be expected within a small portion of the cumulative effects analysis area, but would at least partially occur during the denning period; 2) hiding cover would be removed in the short-term on a small portion of the cumulative effects analysis area, but would be expected to recovery fairly rapidly; 3) no changes in long-term open road density would occur, and 4) no changes to security habitats would be expected.

Canada Lynx

Direct and Indirect Effects of the No-Action Alternative to Canada Lynx

In the short-term, no changes in lynx habitat elements would be expected in the project area. In the longer-term, barring any major natural disturbances, natural succession would advance several classes forward, generally improving several classes of lynx habitats; however, summer foraging habitats would continue to be absent from the project area. Winter foraging habitats would be expected to remain at similar levels, or increase in the future, as shade-tolerant trees develop in the understory and coarse woody debris accumulates through time due to natural events. Landscape connectivity would not be altered. Thus, a negligible risk of adverse direct and indirect effects to Canada lynx would be expected since: 1) existing winter foraging habitats would persist; 2) summer foraging habitats would continue to be absent without disturbance; 3) the amount of temporary non-suitable habitats would not increase; and 4) landscape connectivity would not be altered.

Cumulative Effects of the No-Action Alternative to Canada Lynx

No appreciable change in lynx habitats in the cumulative effects analysis area would occur, except the continued maturation of stands. Winter foraging habitats would be expected to improve in the future as shade-tolerant trees continue to develop in the understory, coarse woody debris accumulates through time due to natural events, and, in general, stands continue maturing out of summer foraging and other

suitable habitats. No appreciable changes to landscape connectivity would be anticipated. Proposed harvesting on USFS-managed lands could alter lynx habitats in the future. Thus, a negligible risk of adverse cumulative effects to lynx would be expected since: 1) winter foraging habitats would persist in the cumulative effects analysis area; 2) summer foraging habitats would continue maturing and longer-term availability of summer foraging habitats would likely decline without disturbance; 3) no changes in the amount of temporary non-suitable habitat would occur; and 4) landscape connectivity would not be altered.

Direct and Indirect Effects of the Action Alternative to Canada Lynx

Approximately 147 acres of lynx habitats (57% of lynx habitats in the project area) would be altered with proposed activities. Roughly 78 acres of winter foraging habitats and 69 acres of other suitable habitats would be altered with the proposed treatments. Approximately 110 of those acres (46 acres winter foraging, 64 acres other suitable habitats) would be converted to temporary non-suitable lynx habitats; roughly 31 acres of winter foraging habitats would be converted to other suitable lynx habitats and an additional 5 acres of other suitable lynx habitats would be modified, but would remain as other suitable habitat. The younger-aged stands created with this alternative could provide summer foraging habitats into the future, as tree seedlings and shrubs recover and begin providing habitats for snowshoe hares. Retention of patches of advanced regeneration of shade-tolerant trees, such as grand-fir, in units 30-1, 30-3, and 30-4, would break-up site distances, provide horizontal cover, and provide forest structural attributes preferred by snowshoe hares and lynx. The total amount of lynx habitats in the project area in the temporary non-suitable lynx habitat class would increase to roughly 43%. Forested connectivity could be slightly altered with the proposed activities, but overall connectivity would be maintained with several corridors being retained along riparian areas, draws, ridges, and other topographic features. Collectively, a moderate risk of adverse direct and indirect effects to Canada lynx would be expected since: 1) winter foraging habitats would be reduced; 2) summer foraging habitats would continue to be absent from the project area, but some future summer foraging habitats would be created; 3) the amount of the project area in the temporary non-suitable lynx habitat category would increase to roughly 43%; and 4) connectivity could be slightly decreased, but connectivity would be maintained.

Cumulative Effects of the Action Alternative to Canada Lynx

Within the cumulative-effects analysis area, lynx habitats would continue to persist. Reductions in winter foraging coupled with the increases in other suitable and temporary non-suitable habitats on the portions of the cumulative effects analysis area managed by DNRC could slightly decrease the quality of the lynx habitats in the cumulative effects analysis area. Within the cumulative effects analysis area, the extensive forested habitats would be expected to continue providing suitable lynx habitats, which likely includes considerable winter foraging habitats. Near-term increases in summer foraging habitats would be anticipated with the proposed harvesting within a portion of the cumulative effects analysis area and would be additive to the potential summer foraging habitats that likely exist on other ownerships in the cumulative effects analysis area. Anticipated reductions in lynx habitats would be additive to past losses from timber harvesting and recent wildfires; likewise, increases in temporary non-suitable lynx habitats would be additive to recently converted lynx habitats due to timber harvesting and recent wildfires. The proposed harvesting on USFS-managed lands could alter lynx habitats in the cumulative effects analysis area. A small increase in the amount of the cumulative effects analysis area that is in the temporary non-suitable lynx habitats would occur; however much of the lynx habitats would be in a usable state for lynx. Forest connectivity would not be appreciably altered within the cumulative effects analysis area. Thus, a minor risk of adverse cumulative effects to Canada lynx would be expected since: 1) adequate winter foraging habitats would persist; 2) summer foraging habitats would continue developing for the next 10 to 30 years; 3) a small increase in the amount of the cumulative effects analysis area in the temporary non-suitable habitat category would occur, but most of the lynx habitats would be in a usable state for lynx; and 4) negligible alterations in landscape connectivity would not prevent lynx movements.

Sensitive Species

Fisher

Direct and Indirect Effects of the No-Action Alternative to Fisher

No direct and indirect effects to fisher would be expected since: 1) no changes to existing habitats would be anticipated; 2) landscape connectivity would not be altered further; 3) no appreciable changes to snags, snag recruits, and coarse woody debris levels would be anticipated; and 4) no changes to human access or the potential for trapping mortality would be anticipated.

Cumulative Effects of the No-Action Alternative to Fisher

No further cumulative effects to fishers would be anticipated since: 1) no changes to existing habitats on DNRC-managed lands would occur; 2) landscape connectivity afforded by the stands on DNRC-managed lands would not change appreciably; 3) no changes to snags, snag recruits, or coarse woody debris levels would be expected; and 4) no changes to human access or the potential for trapping mortality would be anticipated.

Direct and Indirect Effects of the Action Alternative to Fisher

No riparian fisher habitats would be altered with this alternative. Approximately 31 of the 75 acres (41%) of upland fisher habitats in the project area would receive treatments; the majority of the upland fisher habitats proposed for treatment (28 of 31 acres) would receive an old growth restoration treatment which would result in stands that are too open for appreciable fisher use. The remaining 3 acres would receive individual tree selection treatments, which would likely retain sufficient canopy closure to be considered fisher habitats following proposed treatments. No changes in open roads would be anticipated, which would not likely alter trapping pressure and the potential for fisher mortality. Negligible reductions in landscape connectivity could occur with the proposed activities, but activities would avoid riparian areas commonly used by fisher. Thus, a minor risk of adverse direct and indirect effects to fisher would be anticipated since: 1) harvesting would avoid riparian areas; 2) harvesting would remove upland fisher habitats; 3) negligible reductions in landscape connectivity would occur, but those areas associated with riparian areas would remain unaffected; 4) harvesting would reduce snags and snag-recruitment trees while increasing coarse woody debris levels; however, some of these resources would be retained; and 5) no appreciable changes in motorized human-access levels would be anticipated.

Cumulative Effects of the Action Alternative to Fisher

Since no changes in riparian fisher habitats would occur, no changes in the amount of the preferred riparian fisher cover types meeting structural requirements for fishers at the cumulative-effects analysis area would occur. Minor reductions in suitable upland fisher habitats in the project area would lead to negligible reductions in the amount of suitable upland fisher habitats in the cumulative effects analysis area. These reductions would be additive to the losses associated with past timber harvesting and recent wildfires in the cumulative-effects analysis area as well as any ongoing and/or proposed harvesting. No appreciable changes to landscape connectivity would be anticipated, and activities would avoid riparian areas commonly used by fisher. No appreciable changes in human disturbance and potential trapping mortality would be anticipated. Thus, a minor risk of adverse cumulative effects to fisher would be anticipated since: 1) harvesting would remove upland fisher habitats, but considerable upland habitats would persist; 2) no appreciable changes in landscape connectivity would be anticipated, but connectivity in riparian areas would not be altered; 3) harvesting in a relatively small portion of the cumulative-effects analysis area would partially reduce snags and snag recruits, while increasing the coarse woody debris levels, largely in the smaller-sized pieces; and 4) no appreciable changes to motorized human access would occur.

Flammulated Owl

Direct and Indirect Effects of the No-Action Alternative to Flammulated Owls

Existing flammulated owl habitats in the project area would persist. With advancing succession, stands could continue to become densely stocked and exist at high risk to insects, disease and stand-replacement fire. Therefore, habitat sustainability and quality for flammulated owls would continue to decline. Thus, a negligible risk of adverse direct and indirect effects to flammulated owls would be

anticipated since: 1) no harvesting would occur; 2) no changes to potential nesting habitats would be anticipated; 3) no disturbance to flammulated owls would be anticipated; and 4) long-term, succession-related declines in foraging habitats coupled with advancing succession leading to denser stands.

Cumulative Effects of the No-Action Alternative to Flammulated Owls

Existing flammulated owl habitats would persist. Recent timber management in the cumulative effects analysis area has potentially improved flammulated owl habitats by creating foraging habitats and reversing a portion of the Douglas-fir encroachment, however retention of large ponderosa pine and/or Douglas-fir was not necessarily a consideration in some of these harvest units, thereby minimizing the benefits to flammulated owls. Ongoing activities on USFS managed lands as well as any proposed harvesting on USFS lands could also improve flammulated owl habitats in the cumulative effects analysis area. Otherwise, areas exhibiting mature forested conditions would be expected to persist and could provide flammulated owl nesting habitats into the future. Thus, a negligible risk of adverse cumulative effects to flammulated owls would be anticipated since: 1) no further harvesting would occur, 2) no changes to potential nesting habitats would be anticipated, and 3) long-term, succession-related declines in foraging habitats coupled with advancing succession leading to denser, less suitable foraging conditions.

Direct and Indirect Effects of the Action Alternative to Flammulated Owls

Proposed timber harvest on 289 acres of flammulated owl habitats (38.3% of flammulated owl habitats in the project area) would open the canopy while favoring western larch, ponderosa pine, and Douglas-fir. Elements of the forest structure important for nesting flammulated owls, including snags, numerous leave trees, and snag recruits would be retained in the proposed units. The more open stand conditions, the retention of fire adapted tree species, and the maintenance of snags would move the proposed project area toward historical conditions, which is preferred flammulated owl habitat. Flammulated owls are tolerant of human disturbance (McCallum 1994), however the elevated disturbance levels associated with activities proposed for the nesting season could negatively affect flammulated owls. Roughly 104 acres of flammulated owl habitats would be harvested during the winter period, which would not be expected to disturb nesting flammulated owls; the remaining 185 acres of flammulated owl habitats would not have a specified operating season, meaning activities could disturb nesting flammulated owls if they were conducted in the nesting season. Thus, minor positive direct and indirect effects would be expected to flammulated owls since: 1) harvesting would open up dense stands of ponderosa pine and Douglas-fir leading to more open stands with scattered mature ponderosa pine; 2) elements of forest structure used for foraging and nesting by flammulated owl would be retained; 3) some disturbance to nesting flammulated owls would be possible, but a portion of the activities would be conducted during the winter period, limiting potential disturbance to flammulated owls; and 4) prescriptions would promote future development of ponderosa pine in the units.

Cumulative Effects of the Action Alternative to Flammulated Owls

Proposed harvesting would increase the amount of the cumulative-effects analysis area that has been recently harvested, which would add to the amount of potential habitat available, but possibly at the expense of losing valuable snags and large trees important for nesting. Overall a slight improvement in habitat quality at the cumulative-effects analysis area level could be realized with this alternative. Ongoing and proposed activities within the cumulative effects analysis area could continue altering flammulated owl habitats. Thus, negligible beneficial cumulative effects to flammulated owls would be expected since: 1) harvesting would improve the quality and sustainability of flammulated owl habitat on a small number of acres; 2) flammulated owl nesting habitats would be retained; and 3) a small increase in the amount of the cumulative-effects analysis area would be more representative of historic conditions.

Gray Wolf

Direct and Indirect Effects of the No-Action Alternative to Gray Wolves

Disturbance to wolves would not increase. No changes in big game habitat, including no changes to big game winter ranges, would be expected during the short-term; therefore, no changes in wolf prey availability would be anticipated. Thus, no direct and indirect effects would be expected to gray wolves

since: 1) no changes in human disturbance levels would occur; and 2) no changes to prey availability would occur.

Cumulative Effects of the No-Action Alternative to Gray Wolves

White-tailed deer and elk winter ranges would not be affected and substantive changes in big game populations, distribution, or habitat use would be not anticipated. Levels of human disturbance would be expected to remain similar to present levels. Past harvesting and any ongoing harvesting may cause shifts in big game use and, subsequently, gray wolf use, of the cumulative-effects analysis area; however, no changes would be anticipated that would alter levels of gray wolf use of the cumulative-effects analysis area. Thus, no further cumulative effects to gray wolves would be expected since: 1) no changes in human disturbance levels would occur, particularly near known wolf den and/or rendezvous sites; and 2) no changes to prey availability would occur.

Direct and Indirect Effects of the Action Alternative to Gray Wolves

Wolves using the area could be disturbed by harvesting activities and are most sensitive at den and rendezvous sites, which are not known to occur in the project area or within 1 mile of the project area. After harvesting activities, human disturbance levels would likely revert to pre-harvest levels. Likewise, wolf use of the project area for denning and rendezvous sites would likely revert to pre-harvest levels. In the short-term, the proposed harvesting could lead to shifts in big game use, which could lead to a shift in wolf use of the project area. Harvesting on 438 acres of winter range would alter roughly 1/3 of the existing winter range and nearly 1/2 of the stands in the project area with dense canopies that are providing thermal cover and snow intercept. Collectively, the modifications to summer and winter range would likely alter big game use of the project area, and subsequently alter the use of the project area by wolves. Thus, a low risk of direct and indirect effects would be expected to gray wolves since: 1) minor short-term increases and no long-term changes in human disturbance levels would occur, with no increases near known wolf den and/or rendezvous sites anticipated; and 2) changes to summer and winter big game habitats would alter big game use of the project area, but would not appreciably alter prey availability.

Cumulative Effects of the Action Alternative to Gray Wolves

Reductions in thermal cover and snow intercept capacity on a portion of the winter range in the cumulative effects analysis area would likely redistribute the big game relying on those habitats, and subsequently shift wolf use of a small portion of the cumulative effects analysis area. Reductions in cover may cause slight decreases in use by deer and elk; however, no appreciable changes would be expected within the cumulative-effects analysis area. These reductions in cover would be additive to losses from past timber-harvesting activities and recent wildfires; ongoing and proposed harvesting in the cumulative-effects analysis area could further reduce cover for big game. No changes in motorized human access would be anticipated. No substantive change in wolf use of the cumulative-effects analysis area would be expected; wolves would continue to use the area in the long-term. Thus, a low risk of cumulative effects to gray wolves would be expected since: 1) elevated human disturbance levels would be short-lived and negligible changes to long-term disturbance levels would be anticipated with no increases near known wolf den and/or rendezvous sites; and 2) modifications to big game winter range could alter big game distributions, but would not appreciably alter prey availability.

Pileated Woodpecker

Direct and Indirect Effects of the No-Action Alternative to Pileated Woodpeckers

A negligible risk of adverse direct and indirect effects to pileated woodpeckers would be expected since: 1) no further harvesting would occur; 2) no changes in the amount of continuously forested habitats would be anticipated; 3) no appreciable changes to existing pileated woodpecker habitats would be anticipated; and 4) long-term, succession-related declines in the abundance of shade-intolerant tree species, which are valuable to pileated woodpeckers, would be anticipated.

Cumulative Effects of the No-Action Alternative to Pileated Woodpeckers

No disturbance of pileated woodpeckers would occur. Continued use of the cumulative-effects analysis area by pileated woodpeckers would be expected at similar levels as presently occurring. Ongoing

harvesting on USFS lands in the cumulative effects analysis area would continue altering pileated woodpecker habitats; proposed harvesting on USFS lands could also alter pileated woodpecker habitats in the cumulative effects analysis area. Thus, a negligible risk of adverse cumulative effects to pileated woodpeckers would be expected since: 1) no further changes to existing habitats would occur; 2) no further changes to the amount of continuously forested habitats available for pileated woodpeckers would be anticipated; and 3) long-term, succession-related changes in the abundance of shade-intolerant tree species, which are valuable to pileated woodpeckers, would occur.

Direct and Indirect Effects of the Action Alternative to Pileated Woodpeckers

Pileated woodpeckers tend to be tolerant of human activities (Bull and Jackson 1995), but might be temporarily displaced by the proposed harvesting of up to 249 acres as well as any other activities that may occur during the nesting period; no disturbance to pileated woodpeckers would be anticipated from the proposed harvesting of roughly 190 acres during the non-nesting period. Harvesting would reduce continuously-forested habitats for pileated woodpeckers. Roughly 50 acres of the potential nesting habitat would be largely removed. Meanwhile, an additional 382 acres of potential foraging habitats would be modified, however most of these acres would continue to be dense enough to receive some use by foraging pileated woodpeckers. Potential pileated woodpecker habitats would be reduced for 30-100 years, depending on the density of trees retained. Elements of the forest structure important for nesting pileated woodpeckers, including snags, coarse woody debris, numerous leave trees, and snag recruits would be retained in the proposed harvest areas. Since pileated woodpecker density is positively correlated with the amount of dead and/or dying wood in a stand (McClelland 1979), pileated woodpecker densities in the project area would be expected to be reduced on 438 acres. The silvicultural prescriptions would retain healthy western larch, ponderosa pine, and Douglas-fir while promoting the growth and/or regeneration of many of these same species, which would benefit pileated woodpeckers in the future by providing nesting, roosting, and foraging habitats. Thus, a minor risk of adverse direct and indirect effects to pileated woodpeckers would be anticipated since: 1) harvesting would reduce the amount of continuous-forested habitats available; 2) some potential nesting habitats would be removed and moderate reductions in potential foraging habitats would be anticipated; 3) snags and snag recruits would be removed; however, mitigation measures to retain snags and snag recruits would be included, and 4) proposed treatments would promote seral species in the project area.

Cumulative Effects of the Action Alternative to Pileated Woodpeckers

Minor changes in pileated woodpecker habitats and further reductions in the amount of continuously forested habitats available for pileated woodpeckers would occur. Several snags, coarse woody debris, and potential nesting trees would be retained in the project area; however, future recruitment of these attributes may be reduced in a portion of the area by the proposed activities. Any loss of pileated woodpecker habitats under this alternative would be additive to habitat losses associated with past harvesting; continued use of the cumulative-effects analysis area would be expected. Ongoing harvesting as well as proposed harvesting could continue altering pileated woodpecker habitats. Continued maturation of stands across the cumulative-effects analysis area is increasing suitable pileated woodpecker habitats. Thus, a minor risk of adverse cumulative effects to pileated woodpeckers would be anticipated since: 1) harvesting would reduce the amount of continuous forested habitats available in the cumulative-effects analysis area, but forested habitats would persist; 2) potential nesting and foraging habitats would be reduced, but habitats would persist in the cumulative-effects analysis area; 3) snags and snag recruits would be removed; however, mitigation measures would retain some of these attributes; and 4) proposed treatments would promote seral species in a small portion of the cumulative effects analysis area.

BIG GAME

Big Game Winter Range

Direct and Indirect Effects of the No-Action Alternative to Big Game Winter Range

No direct or indirect effects to big game winter range would be anticipated since: 1) subtle changes in thermal cover due to mortality and successional advances increasing canopy densities would be anticipated; 2) the amount of mature forested habitats on the winter range would not change appreciably; and 3) the levels of human disturbance would remain similar.

Cumulative Effects of the No-Action Alternative to Big Game Winter Range

Continued winter use of the larger winter range would be expected. No further changes in thermal cover and snow intercept would be anticipated. Human disturbance levels would be anticipated to continue at similar levels. Thus, minor positive cumulative effects to big game winter range would be anticipated since: 1) subtle changes in thermal cover due to advances in succession that would increase canopy densities would be anticipated over time; 2) the amount of mature forested habitats on the winter range would not change; and 3) the levels of human disturbance would remain similar.

Direct and Indirect Effects of the Action Alternative to Big Game Winter Range

Some displacement would be expected as a result of the proposed activities that would occur in the winter on roughly 190 acres; additional disturbance and displacement would be expected if some or all of the other 249 acres were harvested during the winter. However, winter logging provides felled tree tops, limbs, and slash piles that could concentrate feeding deer during nighttime and quiet periods when logging operations are shut down. Increasing short-term forage availability in this manner may partially offset some of the effects associated with temporary displacement caused by logging disturbance. This short-term benefit would not be expected to offset effects associated with removal of thermal cover over the long-term (several decades). Roughly 71 acres (11.6%) of white-tailed deer winter range and 438 acres (33.3%) of elk winter range are proposed for treatment in the project area. Stands providing snow intercept and thermal cover for big game exist on roughly 383 of those acres of winter range. Following proposed treatments, thermal cover and snow intercept would be largely removed from 161 acres, eliminating habitat attributes that would enable concentrated winter use by deer and elk. Similarly, the proposed individual tree selection treatment on roughly 223 acres of winter range would reduce stand density, which would reduce snow intercept and thermal cover attributes in that portion of the project area as well. Overall, approximately 47.6% of the stands that are likely providing thermal cover and snow intercept would be modified with the proposed treatments, which includes the near-term removal of approximately 20.0% of these stands with dense canopies providing thermal cover and snow intercept. Collectively, the reductions in thermal cover and snow intercept would require 30-70 years for suitable sized trees (>40 ft. tall) to develop in the stand. Proposed timber harvesting would not prevent big game movement through the project area appreciably in winter and could stimulate browse production within the units. Thus, a minor risk of adverse direct or indirect effects to big game winter range would be anticipated since: 1) the relatively short-term that logging activities could create disturbance in this area, which would occur over a sizeable portion of project area in the winter; 2) harvesting would alter and/or remove stands that are providing thermal cover and snow intercept habitats for big game species; and 3) a moderate amount of the winter range in the project area would be altered.

Cumulative Effects of the Action Alternative to Big Game Winter Range

Disturbance and displacement associated with this alternative would be additive to any displacement associated with ongoing activities in the cumulative effects analysis area and any other disturbances that may be affecting wintering big game. Similarly, any harvesting that may be occurring on other ownerships in the cumulative effects analysis area could continue altering big game winter range and/or disturbing big game. Reductions in thermal cover and snow intercept in the project area would further reduce the amount of the larger winter range providing these attributes for big game. Thus, a minor risk of adverse cumulative effects to big game would be anticipated since 1) the relatively short-term that

logging activities would create disturbance in a small portion of the cumulative effects analysis area; 2) a small percentage of the larger winter range would be altered; 3) availability of lower-quality cover in the vicinity that provides some opportunity for big game should they be displaced.

Elk Security Habitat

Direct and Indirect Effects of the No-Action Alternative to Elk Security Habitat

No risk of adverse indirect effects to elk security habitats would be expected since: 1) no changes in existing elk security habitats would be anticipated and continued maturation of forest cover could improve elk security habitats; 2) the level of human access to the project area would not change; and 3) no appreciable changes to big game survival would be anticipated.

Cumulative Effects of the No-Action Alternative to Elk Security Habitat

No changes in elk security habitat would be anticipated. Past harvesting and recent wildfires reduced elk security habitats and allowed increased human access. Ongoing harvesting on USFS lands would continue altering elk security habitats; proposed harvesting on USFS lands could also reduce elk security habitats. Continued maturation in previously harvested stands in the cumulative-effects analysis area would improve hiding cover in those areas. No other changes in disturbance and potential mortality due to hunting would be anticipated. Thus, a minor risk of positive cumulative effects to elk security habitats would be anticipated since: 1) no changes in open roads, motorized access, or human access would be anticipated; 2) no reductions in elk security habitat would occur; and 3) modest levels of security habitat (>30%) and hiding cover would persist within the cumulative-effects analysis area, and 4) no appreciable changes to big game survival would be anticipated.

Direct and Indirect Effects of the Action Alternative to Elk Security Habitat

No changes in open roads or motorized access for the general public would occur. During all phases of the project, any roads opened with project activities would be restricted to the public and closed after the completion of project activities. Proposed new roads would be restricted to the public, but could facilitate non-motorized access during the hunting season using mountain bikes, horses, and/or foot travel; roughly 0.40 miles of restricted road would be reclaimed, which would partially offset this increase in non-motorized access. The hiding cover component would be largely removed from roughly 111 acres (18.8% of the elk security habitats in the project area) proposed to receive old growth restoration and sanitation/salvage treatments and would be reduced in quality on another 217 acres (36.7% of the elk security habitats in the project area) proposed to receive an individual tree selection treatment. These reductions in hiding cover would be short-lived and hiding cover would improve fairly rapidly as trees and shrubs become reestablished. The retention of structure and un-harvested areas between the various units would reduce the potential effects of the hiding cover reductions. Overall increased sight distances and the modification of hiding cover may slightly increase elk vulnerability risk in the project area. Collectively, a minor risk of adverse effects to elk security habitats would be anticipated since: 1) no changes in open roads or motorized access for the general public would be anticipated; 2) minor increases in non-motorized access could increase hunter access; 3) modifications to existing hiding cover would reduce elk security habitat by 18.8% in the project area while reducing hiding cover on an additional 36.7% of the elk security habitats in the project area; and 4) negligible changes in big game survival would be anticipated.

Cumulative Effects of the Action Alternative to Elk Security Habitat

No changes in public, motorized access and negligible increases in non-motorized access would be expected, which would not appreciably affect elk vulnerability in the cumulative effects analysis area. Alterations of cover would reduce the 1 block of elk security habitats by 8.9% (111 acres) and wouldn't alter the other 2 blocks of security habitats. Overall, at the cumulative effects analysis area level, elk security habitats would continue to be present on roughly 12,895 acres (35.8%), which would exceed the 30-percent minimum threshold established by Hillis et al. (1991). Ongoing harvesting on USFS lands would continue altering hiding cover; proposed harvesting on USFS lands would not alter existing elk security habitats. Continued maturation across the cumulative-effects analysis area would improve hiding cover and elk security habitats. Negligible impacts to big game survival would be anticipated. Thus, a

minor risk of adverse cumulative effects to elk security would be anticipated since: 1) no changes in open roads or motorized access for the general public would be expected; 2) quality of hiding cover in a small portion of the cumulative effects analysis area would be reduced, which would reduce the quality of the elk security habitats; 3) security habitat and hiding cover would persist in the cumulative-effects analysis area; and 4) negligible changes in big game survival would be anticipated.

CHAPTER 5: SLOCUM CREEK TIMBER SALE FINDINGS

An Environmental Analysis (EA) has been completed for the proposed Department of Natural Resources and Conservation (DNRC) Slocum Creek Timber Sale. After a thorough review of the EA, project file, public correspondence (including scoping responses), Department policies, rules, and the Habitat Conservation Plan (HCP) I have made the following decisions:

5.0 ALTERNATIVE SELECTED

Two alternatives are presented and were fully analyzed in the EA: the No-Action Alternative, which includes existing activities, but does not include a timber sale (EA, page 12); The Action Alternative which proposes harvesting approximately 2.1 MMBF.

For the following reasons, I have selected the Action Alternative without additional modifications:

- a. In my opinion, the Alternative best meets the purpose and need for action and the specific project objectives listed in the EA on pages 18 & 19. The Action Alternative is projected to generate a near term return from timber harvest of \$142,882 and \$21,350 to the “common school” and “public building” trusts that would not be realized under the no action Alternative A. The environmental effects of the Action Alternative are acceptable as compared with Alternative A. No major losses in habitat, or unacceptable effects to water or soil would occur under Alternative B.
- b. The analysis of identified issues did not reveal information compelling the DNRC not to implement the Action Alternative.
- c. The proposed action includes activities and mitigations to address environmental concerns expressed by DNRC staff and the public. For example, it includes improvements to the roads in the project area to meet Best Management Practices (BMPs) (EA, page 37); and improves timber stand health and productivity where harvesting is proposed (EA, pages 37).

5.1 SIGNIFICANCE OF IMPACTS

For the following reasons, I find that the proposed action would not have significant impacts on the environment:

- a. Wildlife

Because of the proposed action there would likely be minor to low risk of cumulative effects to big game winter range within the analysis area (page 50 & 51).

Neither individual effects nor total effects to big game habitat are below accepted thresholds for this area. This alternative would retain snags unless they pose an unacceptable safety hazard during logging operations.

Sensitive species such as the lynx and fisher have been detected or suspected to be in the general project area. Habitats would be improved for some species and reduced for others. However, none of the estimated changes are identified to be extensive, severe, or of a duration that would cause unacceptable impacts to threatened, & endangered or sensitive species. Mitigations included in the EA would further reduce impacts.

b. Economics

This alternative would provide the largest measure of reasonable and legitimate return over the long run for the Common School (C.S.) and Public Building (PB) trusts on this entry, at approximately (\$164,232 plus \$48,996 for Forest Improvement fees - EA, page 18). Road improvements would enhance opportunities for future management at reduced costs and thus higher values.

c. Water Quality and Soils

No increases in sediment yields are expected to result from the proposed action. The existing haul roads were evaluated and determined to be low risk to water quality and cumulative watershed impacts. BMPs would be fully implemented during new road construction and harvest operations. (EA, page 40).

There is low risk of substantial impacts to long-term soil productivity associated with the proposed action. With the implementation of recommended mitigations, such as cable harvest on slopes over 45% and tractor harvest operations on dry or frozen ground. Erosion at landings would be controlled by proper location, appropriate size, and by implementation of standard BMP's (EA, pages 38 & 39).

d. Timber and Site Productivity

Logging would be completed within a short time frame of one to two years. The proposed silvicultural treatments are conventional techniques that have been previously applied in other projects and have resulted in acceptable environmental changes. The increase in stand vigor, resistance to insects or diseases, establishment of new stands and retention of a good gene pool for a future seed source would not only maintain, but likely improve, options for future timber management and thus revenue. No unique features would be impacted by proposed activities.

e. Precedent Setting and Cumulative Impacts

The proposed timber sale is similar to past projects that have occurred in the area. Since the EA does not identify future actions that are new or unusual, the proposed timber sale is not setting a precedent for a future action with significant impacts.

Taken individually and cumulatively, the identified impacts of the proposed timber sale are within cumulative threshold limits. Proposed timber sale activities are common practices and none of the project activities would be conducted on important, fragile or unique sites.

The proposed timber sale conforms to the management philosophy adopted by the DNRC in the SFLMP; Habitat Conservation Plan and is in compliance with existing laws, policies, and rules applicable to this type of proposed action.

5.2 SHOULD DNRC PREPARE AN ENVIROMENTAL IMPACT STATEMENT (EIS)?

Based on the following, I find that an EIS does not need to be prepared:

- a. The EA adequately addressed the issues identified during project development and displayed the information needed to make the decisions.
- b. Evaluation of the potential impacts of the proposed timber sale indicates that no significant impacts would occur.
- c. Sufficient opportunities for DNRC staff and public review and comment during project development and analysis were provided. DNRC staff and public concerns were incorporated into project design and analysis of impacts.

/S/ ROBERT H. STORER
Trust Lands Program Manager
Southwestern Land Office
October 31, 2012

CHAPTER 6: REFERENCES

6.1 LIST OF PREPARERS AND PERSONS CONSULTED

Paul Moore	Project Leader DNRC Hamilton Unit, Hamilton MT
Robert Storer	Decision Maker DNRC Southwestern Land Office, Missoula MT
Jeff Collins	Hydrologist/Soil Scientist DNRC Southwestern Land Office, Missoula MT
Jim Bower	Fisheries Biologist, Montana Department of Natural Resources, Forest Management Bureau, Missoula, MT
Garrett Schairer	Wildlife Biologist DNRC Southwestern Land Office, Missoula MT
Dana Boruch	Right of Way Specialist DNRC Southwestern Land Office, Missoula MT
Patrick Rennie	Archaeologist DNRC, Agriculture and Grazing Management Bureau, Helena, MT
Tim Spoelma	Silviculturist Montana Department of Natural Resources, Forest Management Bureau, Missoula, MT
Chris Clancy	Fisheries Biologist Montana Department of Fish Wildlife and Parks, Hamilton MT

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6.3 ABBREVIATIONS AND ACRONYMS

Ac.	Acres
ARM	Administrative Rules for Montana
BMP	Best Management Practices
CFR	Code of Federal Regulations
DBH	Diameter at Breast Height
DEQ	Department of Environmental Quality
DF	Douglas-fir
DFC	Desired Future Conditions
DNRC	Department of Natural Resources and Conservation
E	East
EA	Environmental Assessment
EBT	Eastern brook trout
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FWP	Montana Fish, Wildlife, and Parks
HCP	Habitat Conservation Plan
HRA	Hazard Reduction Agreement
HW	Hardwood
ID	Interdisciplinary
IWM	Integrated Weed Management
LP	Lodgepole pine
MBF	Thousand Board Feet
MC	Mixed conifer
MCA	Montana Code Annotated
MMBF	Million Board Feet
MEPA	Montana Environmental Policy Act
N	North
NW	Northwest
PP	Ponderosa pine
R	Range
RT	Rainbow trout
S	South

SAF	Subalpine fir
SE	Southeast
Rules	State Forest Land Management Rules
SMZ	Streamside Management Zone
T	Township
TMDL	Total Maximum Daily Load
USDA	United States Department of Agriculture
USFS	United States Forest Service
W	West
WCT	Westslope cutthroat trout
WL	Western larch
WWP	Western white pine